

NETWORK WORLD

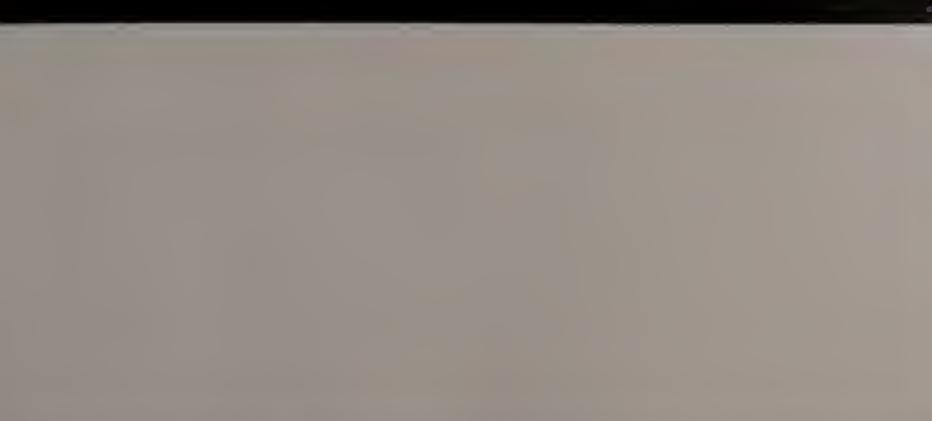
THE CONNECTED ENTERPRISE ■ JULY 18, 2011



CLEAR CHOICE TEST
WLAN MANAGEMENT

Cloud-based services navigate the maze

Aerohive, D-Link and Meraki deliver enticing alternatives to on-site management. **Page 24** ▶

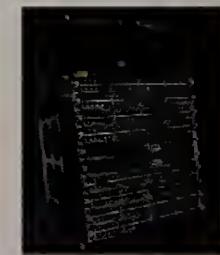


Cisco's resolve unflagging despite looming layoffs

BY JIM DUFFY

LAS VEGAS — Despite the specter of perhaps the largest layoff in Cisco's history overhanging its annual customer conference, the company last week conducted business pretty much as usual at Cisco Live!

The conference, attended physically by 15,000 and virtually by 40,000, was heavy on topics such as data center, cloud, and Cisco's moves to correct the mistakes of recent quarters and years. Indeed, CEO John Chambers' keynote was almost contrite in tone as he sought to reassure customers that Cisco will come through its current challenges stronger and more resolute in every aspect of the company.



TEST: Cisco powers up Catalyst 4500 switch

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Microsoft touts Windows 8 promise, Skype/Lync pairing

BY JON BRODKIN

MICROSOFT'S ANNUAL partner conference last week featured previews of the Windows 8 server and desktop operating systems, talk of integration between Skype and Lync, and a barrage of insults aimed at the company's competitors.

While Microsoft CEO Steve Ballmer scoffed at Apple's Mac sales numbers compared to the 400 million Windows 7 licenses sold, Microsoft COO Kevin Turner bashed Google, Cisco, IBM, Oracle and VMware.

Office 365 is "nothing but a Google butt-kicker," while IBM's Lotus Notes is hemorrhaging customers to Microsoft, and Cisco's unified communications product, Oracle's

▶ See Microsoft, page 16



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JULY 18, 2011

FROM THE EDITOR | KEITH SHAW

Vacation, all we ever wanted

Our esteemed editor-in-chief, John Dix, was on vacation this week, and that's a good thing. Not just because I get to take his place on this page, but because taking a vacation — whether you're a regular employee or president of the company — is a good idea.

You'd think that was obvious, but growing research says that many workers in the U.S. are not getting that message. In a recent study by CareerBuilder.com, workers reported that they are not taking vacations — and if they are, they're taking work with them, which hardly qualifies as "getting away from it all." In the survey:

- 30% of workers plan to take the office with them and work while on vacation.
- 30% said they will contact work while on vacation, up from 25% in 2010.
- 24% said they can't afford to take a vacation this year, up from 21% in 2010.
- 16% said they gave up vacation days in 2010 because they didn't have time to use them.

In a separate poll by Regus (provider of workplace facilities), 66% of survey respondents said they will check and respond to email during their time off, and 29% expect to attend meetings virtually while on vacation.

Advances in technology have made it possible for workers to bring gadgets along with them on vacation so they can stay connected, and for IT staffs that can be a blessing and a curse. Since employees can still work while they're away from the office (for example, performing equipment resets via their smartphone), this doesn't give them a chance to really relax and forget about what's going on back at the office.

It's also not healthy for a business to be reliant on just one person who may feel too important to take any vacation time. Not just because of the health concerns for that one person, but from a security standpoint, as well. In addition to making sure employees take vacations, make sure there are backup and contingency plans for covering that employee's work. The plan needs to be more than, "We'll just call when something breaks."

Vacations over the summer can be tricky for IT groups, which tend to use the time for upgrades and other maintenance projects, mainly because other employees at the company are often taking their own vacations. If your company uses summer for these purposes, it's even more important to have your staff take vacations in the fall or spring, to prevent burnout and other health issues.

Many tech departments are considering mandatory vacations as a best practice, which may rub employees the wrong way, especially those Type-A staffers who say they don't need a vacation or who think they are too valuable. But the benefits to the company (and the employee) far outweigh these concerns.

Again, you'd think this was obvious, but one in three workers are still not getting the message.



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NETWORKWORLD

Google+: Beta, not 1.0

→ I'M FEELING THAT Google+ is now in its invite-only beta mode, working out those kinks and seeing what Google has missed. Which is the reason for not unleashing it upon the world (Re: "Giving Google a B-minus for Plus"; tinyurl.com/66u5nw3).

The fact that the beta is getting this much attention is a good thing, but Google's releases have a history of getting hyped and then appearing so much later that people don't take them on.

Facebook has had a seven-year head start on this platform and Google+ needs to work well for people to not just abandon it immediately, so by Google slowly bringing people in and letting them add people and controlling the influx and reading people's comments and feedback, it's balancing a good experience with growth rate.

Google has to play this very carefully. Too many people on an incomplete experience, it fails; not enough people, it never gets off the ground.

Anon

→ THE IDEA OF having "Circles" of friends is what is really the largest drawback of Facebook and the best selling feature of Google+. That very point has been my beef with Facebook, all the way from the beginning.

The Facebook social model is inherently flawed because it breaks the privacy model of the natural contexts humans use in the relationships of their lives. Really, it is not natural or comfortable having people I knew way back from high school, plus people from my current job, plus my casual acquaintances and good friends, plus family members, plus my parents and plus everyone else from various time periods from my life all in the same room with me at the same time — sharing bits of personal data with all of them at once, and all of them commenting on it and each other.

Now maybe Google+ can bail me out.

Dallas

Too many people on an incomplete experience, it fails; **not enough people, it never gets off the ground.**

Only now?

→ I AM CURIOUS why only now the IETF is looking at home networking issues for IPv6 (Re: "IETF mulls IPv6 for home networking"; tinyurl.com/6dfyp2b). Home networking has been a major issue since at least 2001 when broadband really started to take off and we all had to share one IP address in the house. The fact that this issue is only being researched now tells me it will definitely be many more years before IPv6 gets a foothold in the home.

Aardvark

Corporate smartphone use requires integration

→ IT'S NOT SURPRISING that iPhones are used primarily for games — the integration is lacking at many companies to permit iPhones to interact with their corporate resources. Many companies

have minimal integration to email only at the moment due to the relative risk of introducing full access to corporate systems to these devices. This will change — but it will take time (Re: "And the killer smartphone app is... games!" tinyurl.com/6gmwrke).

Contrast this with BlackBerry, which was once the only rational choice that met enterprise needs. BlackBerrys were purchased by users for the ability to handle their email. Later apps came, and since

this device didn't have consumer mind-share, the game use lagged behind and few users purchased their own device.

This delta in how the devices are procured and how the devices evolved makes it easy to see why games are the most popular apps — but doesn't prove anything with respect to how useful these are in companies with good integration. As the security models mature expect to see more business-critical apps emerge, but don't expect business use to overshadow consumer use — each vertical may some day have great penetration but the common application across all verticals is going to be entertainment.

Anonymous

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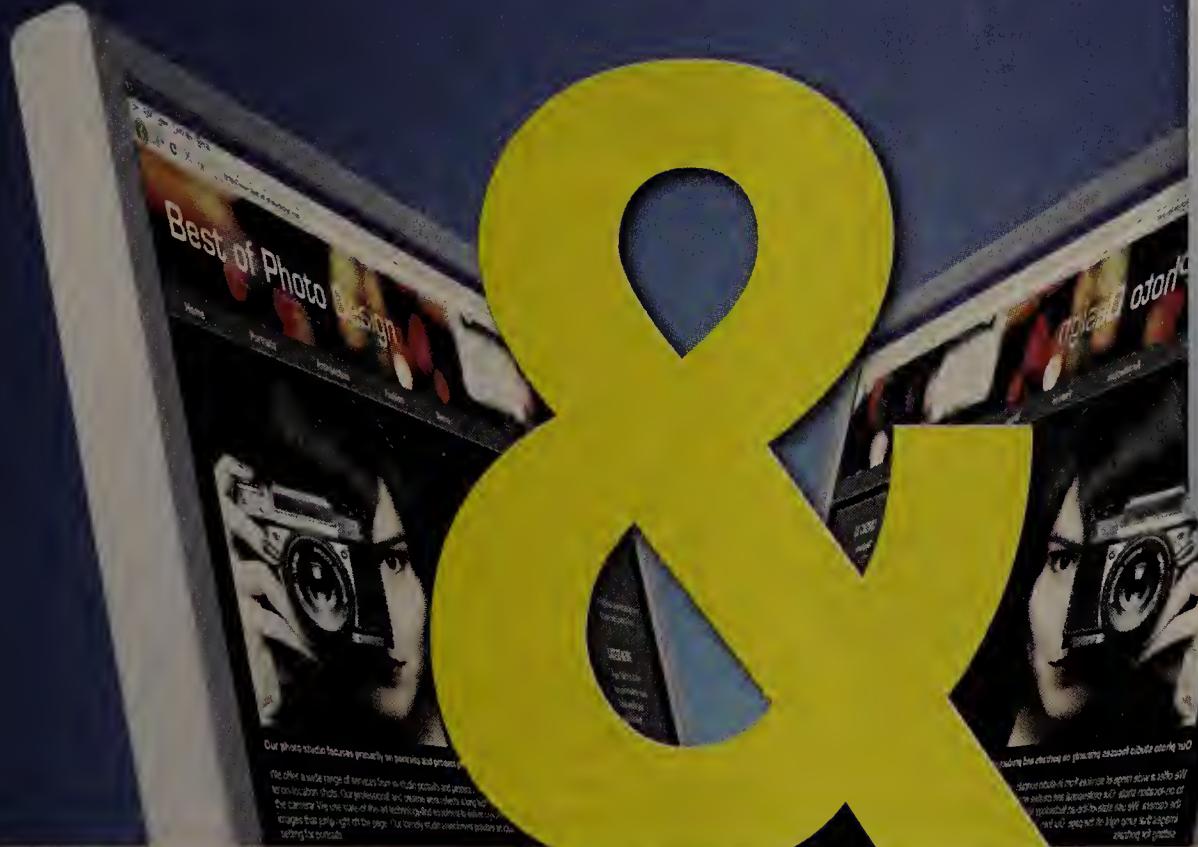
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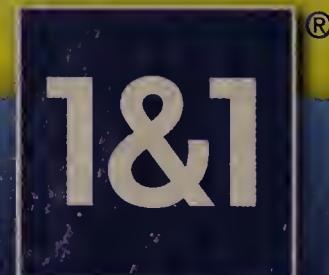
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Amazon finds Kindle 3G sugar daddy

AMAZON HAS ANNOUNCED that AT&T is sponsoring a version of its Kindle 3G under an agreement that will enable customers to buy the e-reader for \$139 if they're willing to put up with the carrier's ads on the home screen and screen saver. That's \$25 less than the previous Kindle 3G with Special Offers price and \$50 less than the regular retail version of the e-reader. An ad-supported Wi-Fi Kindle costs \$115. Amazon/AT&T cover the cost of always-on wireless connectivity, which means customers don't need to hunt for Wi-Fi hotspots or pay monthly wireless fees/annual contract fees to access books and magazines to read on the 6-inch device, which can hold up to 3,500 books.tinyurl.com/6laqjz5



products and bundle them into an integrated release, called the Cloud Infrastructure Suite, the company announced last week. The idea is to let organizations set up an infrastructure that will let them make use of hosted cloud services, said VMware. The package includes new versions of VMware's flagship vSphere virtual machine manager, vCenter Site Recovery Manager, the vShield security framework, the vCloud Director management console and a new product, vSphere Storage Appliance. The package also includes vCenter Operations, which was released earlier this year. tinyurl.com/6yn3m2g

Courts OK Nortel patent buyout

U.S. AND Canadian courts have approved the sale of thousands of patents from bankrupt Nortel Networks to a consortium including Apple and Microsoft for about \$4.5 billion. The purchasing group, which also includes EMC, Ericsson, Research In Motion and Sony, won an auction for the patents on June 30. Last week, the U.S. Bankruptcy Court for the District of Delaware and the Ontario Superior Court of Justice approved the deal at a joint hearing. Nortel is based in Mississauga, Ontario. The portfolio includes more than 6,000 patents and patent applications, including ones covering data networking, wireless, optical, voice, semiconductor and service-provider technologies. tinyurl.com/64r3uzh



'Depraved' Wi-Fi hacker sentenced

A MINNESOTA man has been sentenced to 18 years in prison after he hacked a neighbor's Wi-Fi router and then launched a vengeful two-year campaign to frame them with child pornography and threats to government officials, including

Vice President Joe Biden. Called a "depraved criminal" by prosecutors, a 46-year-old father of two, was sentenced last week, not for Wi-Fi hacking but for the threats, identity theft and child pornography that followed in its wake, all directed against a young couple, Matt and Bethany Kostolnik of Blaine, Minn., and their children. "My husband and I had to explain to our young, innocent children way too early that there are evil people in the world — and to never go in Barry Ardolf's yard," Bethany Kostolnik told U.S. District Judge Donovan Frank. tinyurl.com/6cjx8vt

VMware touts cloud infrastructure

SETTING THE stage for cloud deployments, VMware will update many of its core

Keyboard skills trumping cursive

KEYBOARD TYPING and messaging are the way of future no doubt but at the cost of cursive writing? That seems to be the trend as Indiana last week became one of a number of states that no longer require cursive to be taught, but rather require typing skills instead. The Indiana move is part of a larger move to a common learning and ultimately testing program known as the Common Core State Standards Initiative. That program, adopted by 46 state governors in June 2010, outlines all manner of language and math education yardsticks for the future. Keyboarding is one of



IT Video

Verizon center spotlights 4G projects

Matt Hamblen gets an overview of the Verizon Innovation Center, which opened its doors Tuesday in Waltham, Mass. The center allows companies to collaborate on 4G LTE wireless projects from concept to market.

tinyurl.com/6679y2a

FCC to carriers: Cram this

THE FCC has proposed new rules designed to make it more difficult for telephone carriers and other companies to insert mystery fees onto customers' phone bills. The proposed rules would require landline telephone carriers to notify customers at the point of sale and on each bill of the option to block third-party charges on their phone bills.

The proposed rules would require both landline and mobile carriers to include notices on their phone bills and websites saying customers can file complaints about mystery fees with the FCC.

Consumerization of IT gone wild

MORE PEOPLE are bringing their own tablets and smartphones to work but IT departments have been slow to support them and may not even be aware of the trend, according to a report funded by Unisys and conducted by IDC. IDC surveyed more than 2,600 information workers and 550 IT administrators in nine countries and found that IT administrators aren't aware of how many people use their own devices at work and how extensively they use those devices to access corporate applications. "Enterprises think they are in control of these devices, but in fact they are in control of only a small part of their infrastructure, with a significant number of employees going off the grid in acquiring and using their own devices," IDC said.

Anonymous continues to make name for itself

ANOTHER DAY, another Anonymous attack. The activist outfit this past week added Monsanto to the list of victims, exposing information about thousands of employees and affiliates, as well as government contractor Booz Allen Hamilton, which was attacked as part

of a broader initiative that yielded some 90,000 military emails and password hashes (Booz Allen confirmed the attack, though downplayed the amount/type of content exposed). Also on the hit list: Exxon Mobil and other petroleum companies whose policies Anonymous is against. Anonymous and another recently disbanded hacking group, LulzSec, have also been attacking government and law enforcement targets as part of a campaign they call "AntiSec."

the skills students are expected to master, cursive writing is not. Schools have the option to continue to teach cursive. tinyurl.com/6zdhrxo

DeWalt out at McAfee

week appointed a pair of new leaders to run its McAfee subsidiary after David DeWalt resigned as the unit's president, the company said. The chip maker, which completed the \$7.68 billion acquisition of McAfee in February, appointed co-presidents Michael DeCesare and Todd Gebhart to operate the subsidiary. DeWalt, who was president and CEO of McAfee prior to its acquisition, will continue as a member of the McAfee's board of directors, Intel said, adding that "he is pursuing a CEO role at a non-competitive company." tinyurl.com/68to9wt

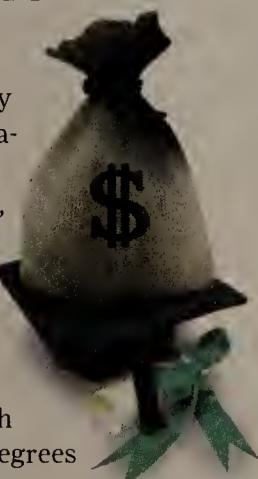
week after Apple crowed that its 3-year-old App Store for iPhones and iPads had passed the 15 billion app download mark. Apple crossed the 1.5 billion app download threshold about a year after the App Store opened, but of course that was pre-iPad. Google recently said its Android Market passed the 4.5 billion app download line. In a blog post, RIM says its BlackBerry App World is now seeing 3 million app downloads a day on average. Those downloads come from both BlackBerry phones as well as the new PlayBook tablet computer. tinyurl.com/66ozf5v

New college grads making more

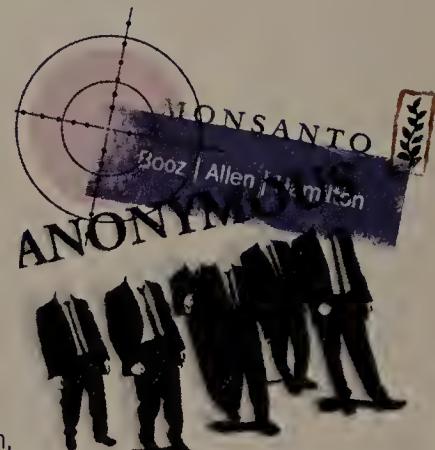
ACCORDING TO a survey conducted by the National Association of Colleges and Employers (NACE), starting salaries being offered to this year's college graduates are up 4.8% over this time last year. Those with computer science degrees are doing just fine, too, although a shade less well than their counterparts in other disciplines. From the organization's press release: As a group, students in the computer science disciplines saw their average offer rise 4.3 percent to \$62,328. Graduates majoring specifically in computer science saw their average salary offer increase 3.7 percent to \$63,402, and the average offer to information sciences and systems graduates rose 4.4 percent to \$57,499. This is the third consecutive quarter of average salary growth, according to NACE. tinyurl.com/66ewyvf

RIM serves up billionth app

RESEARCH IN Motion says its 2-year-old BlackBerry App World has crossed the 1 billion app download mark and that a beta version of the app store upgrade is on the way. The news comes about a



ugly



Who are all these hacker groups?

BY ELLEN MESSMER

HACKER GROUPS that attack or steal — some estimates say there are as many as 6,000 of such groups online with about 50,000 “bad actors” around the world drifting in and out of them — are a threat, but the goals, methods and effectiveness of these groups vary widely.

When they’re angry, they hack into business and government systems to steal confidential data in order to expose information about their targets, or they simply disrupt them with denial-of-service (DoS) attacks. These are the hackers with a cause, the “hacktivists” like the shadowy but well-publicized Anonymous or the short-lived Lulz Security group (which claimed to have just six members and just joined forces with Anonymous).

Over the years, Anonymous is believed to have hit targets that include the Church of Scientology, the Support Online Hip Hop website and the No Cussing Club website, and to have posted pornographic videos disguised as children’s videos onto YouTube. It’s said to have joined with Iranians protesting the results of the June 2009 presidential election in that country. It’s tied to taking down the Australian prime minister’s website in 2009 because of that government’s plans to have ISPs censor porn on the Internet. Anonymous has taken up the cause of piracy activists fighting copyright law by launching DoS attacks against anti-piracy groups and law firms. The group is supporting WikiLeaks, which publishes confidential information, including the U.S. State Department cables allegedly leaked by U.S. Army soldier Bradley Manning, now in a military jail awaiting trial.

Anonymous, perhaps tied to the Sony hacking incidents of this spring, has launched distributed denial-of-service (DDoS) attacks against Amazon, PayPal, MasterCard, Visa and others when the card-payment groups refused to process donations to WikiLeaks. Anonymous has sprung into conflicts, such as this year’s uprisings in the Middle East, hitting the websites of the Tunisian, Egyptian and Libyan governments. The group recently let the world know its chief focus these days is going to be targeting governments and corporations.

But hacktivists like Anonymous are just one type of hacker group. Others are out for financial gain, organized to steal payment-card numbers and personal financial data or to pillage bank accounts. And there are groups that focus on intellectual-property theft or steal valuable information for national interests, money, or both.

Here’s a look at what’s known about some of them — including the ones that unlike the hacktivists, seldom tweet the world about what they do.

The ZeuS gangs: The malware called ZeuS is designed to plunder victims’ PCs to steal financial information and execute fraudulent high-dollar Automated Clearing House (ACH) transfers in corporate bank accounts, resulting in many millions of dollars in fraud against businesses, church groups and government agencies.

The FBI and international law-enforcement partners in the United Kingdom, the Netherlands and the Ukraine managed to disrupt one of the six main ZeuS hacker groups last fall in a sweep that netted about 100 suspects tied to \$70 million in U.S. bank heists. But the leader of what’s called “JabberZeus” (because the specific variant of ZeuS used Jabber instant message to tell gang members when a victim’s online banking credentials were stolen) is still believed to remain at large. And according to Don Jackson, senior security researcher at Dell SecureWorks, which



has worked with businesses and the FBI, there are still five other separate ZeuS hacker groups very active across the world. These Zeus hacker groups have now been connected to a billion dollars in losses, says Jackson.

Dogma Millions: This group, largely Russian, runs what’s known as a “pay-per-install” operation to get victims to download malware they’ve designed. The group is believed to have hundreds of “affiliates” that get paid when a malicious file is installed on a victim’s machine. Dogma Millions is known to have developed specialized software packers and protectors such as rootkits to ensure its malware.

The Chinese hacker puzzle: With a growing number of cyberattacks traced back to mainland China, there’s a lot of interest in hacker groups there, with speculation that there are many dozens of them. Security firm McAfee earlier this year released a

report called “Night Dragon,” which claimed hacker groups from China work regular-hour shifts to try to break into oil companies to steal data.

Over the years, the more famous China hacker groups have included Janker, founded by Wang Xianbing, and the Green Army Corps, founded by Gong Wei, according to researcher Scott Henderson, who runs the website Dark Visitor. Although there is no shortage of suspicion in the U.S. that Chinese hackers have at times worked for the Chinese government to steal secrets from the U.S. and from U.S.-based businesses, there are also times when Chinese authorities have taken steps to shut down hacker groups. For instance, reports said police last year in Hubei province went after hacker group Black Hawk Safety Net and its website that was providing Trojan-based malware.

Over the years, others such as the Network Crack Program Hacker Group based out of Zigong have been identified. The group used a rootkit called GinWui in attacks on the U.S. Department of Defense, other U.S. agencies and Japan about five years ago. GinWui is thought to have been developed by the group’s leader, Tan Dailin, who has used the handle Wicked Rose and later Withered Rose.

The Network Crack Program Hacker Group is believed to have transmitted a large number of documents to China from the U.S. But when Dailin launched DoS attacks against other Chinese hacker groups, including Hackbase, 380Ohk and HackerXfiles, these hacker groups went to Chinese authorities, which arrested Dailin in 2009. He now faces more than seven years in prison.

Inj3ct0r Team: Some hacker groups, particularly the hacktivists, are inclined to make their exploits public by announcing them online in some way or dumping contents they’ve stolen as proof of their prowess. Recently, a group called Inj3ct0r Team claimed it had compromised a server belonging to NATO.

When contacted by IDG, the group said the files were a “server backup, confidential data.”

According to IDG, “inside the files was a notepad document dated July 3 that said: ‘NATO lamers! I’ve been watching you day and night since then! WOOt! Your Machines rooted! Servers restored to default! what else! [Expletive deleted] you and your crimes! And soon enough all your stupid ideas will be published on WikiLeaks!’” One industry source asked about Inj3ct0r Team says the group started as one individual who began finding vulnerabilities in websites and publicizing them, and then attracted a following. ■



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Getting at the real truth about IPv6

BY CAROLYN DUFFY MARSAN

IS 2012 the year to invest in IPv6?

That's what CIOs want to know as they plan their IT budgets for the next fiscal year. They need to decide if they are going to set aside funds to deploy this emerging Internet standard and how much it will cost to upgrade their hardware and software.

The short answer to that question is: yes.

The conventional wisdom in the Internet industry is that CIOs need to invest in IPv6 during 2012 or they will put the growth plans for their online businesses at risk. This is because an increasing number of new mobile and broadband subscribers worldwide will be given IPv6 addresses starting in 2012.

"For an enterprise, it's a safe assumption to make that if you start today to do a design assessment and your addressing plan, you can plan for an IPv6 deployment in the first half of 2012," says Alain Fiocco, who leads the IPv6 program at Cisco. "2012 is when you're going to see some measurable percentage of users on IPv6."

Two recent events have demonstrated to CIOs around the world that the need for IPv6 is both real and imminent: The free pool of available IP addresses using the current protocol, IPv4, was depleted in February, and most IPv4 addresses in the Asia Pacific region were distributed to carriers in April.

Meanwhile, IPv6 has proven itself ready for deployment. On June 8, more than 400 of the Internet's largest players, including Google, Facebook and Yahoo, participated in a 24-hour trial of IPv6 dubbed World IPv6 Day. No major outages, security breaches or performance degradation were reported during the event.

"There was a lot of concern that things would be broken, but the overwhelming majority of participants [in World IPv6 Day] had a positive experience," says Greg Hankins, global solutions architect for Brocade, which has supported IPv6 on its website, email and customer support infrastructure for more than a year. "I don't think I've seen a single horror story or really negative implementation experience from anyone, which speaks a lot about the maturity of IPv6 and the maturity of IPv6 implementations by various switching, routing and appliance vendors."

An estimated 20% of World IPv6 Day participants had such a positive experience with the new protocol that they left it up and running on their public-facing websites after the experiment was over. For example, Blue Coat left IPv6 enabled on its main website, and

Cisco left IPv6 enabled on its www.scansafe.com website.

"We had a little over 1% of our users and traffic, our unique visitors, coming to the cisco.com website over IPv6. That's pretty consistent with the rest of the industry," Fiocco says. "That represents a couple of tens of thousands of unique visitors in 24 hours. None of them had any big, serious problems. ... For users in the U.S., performance in IPv6 was exactly equivalent to IPv4."

The only disappointment for Cisco was that it was expecting 2% of its overall traffic at www.cisco.com to be IPv6 on World IPv6 Day instead of 1%. "That's probably something we need to focus on for the next phase: working with the ISPs so that they enable the eyeballs," Fiocco says.

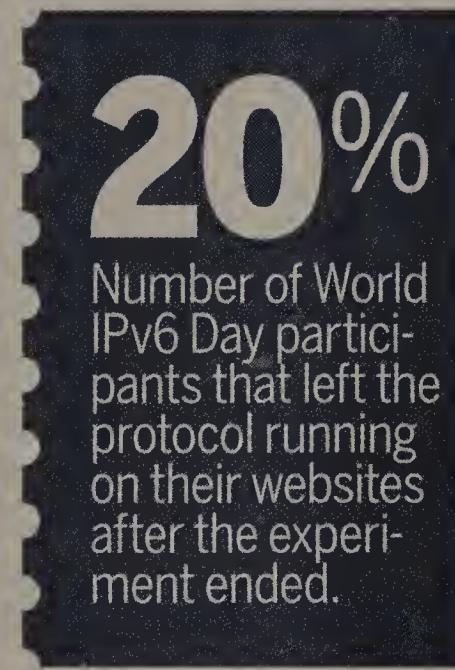
IPv6 explained

IPv6 solves the problem of IPv4 address depletion by offering a virtually limitless pool of IP addresses that can be used by computers, smartphones, home appliances, gaming devices and all sorts of sensors and actuators that have yet to be invented. IPv4 uses 32-bit addresses and can support 4.3 billion devices connected directly to the Internet. IPv6, on the other hand, uses 128-bit addresses and supports 2 to the 128th power devices.

One problem is that IPv6 is not backward compatible with IPv4. So network operators and content providers must support both protocols in a side-by-side configuration known as dual stack. Most carriers and enterprises will solve that problem by deploying network address translation (NAT) devices, which convert inbound IPv6 traffic into IPv4 traffic so IPv6-based users can access existing IPv4-based content and services.

Another problem is that few Internet users have IPv6 access today. This was evident on World IPv6 Day, which was a success for participating content providers but failed to draw as much IPv6 traffic as planners had hoped. The percentage of overall Internet traffic supporting IPv6 doubled on World IPv6 Day, but it still failed to reach even a quarter of 1% of Internet traffic, Arbor Networks says.

"There isn't a lot of access ability for customers, for subscribers or individuals, to



give them a direct IPv6 globally scoped address to get them to IPv6 content," says Rob Malan, co-founder and CTO of Arbor Networks. "Almost all IPv6 traffic gets converted and then goes to the IPv4 content."

One of the key issues for CIOs to monitor is the rate at which wireless and broadband carriers provide their new subscribers with IPv6 addresses. A major driver for IPv6 is Verizon's new LTE network,

which requires that all devices support IPv6. Meanwhile, Comcast, Time Warner Cable, Cox Communications and other U.S. broadband providers have ongoing IPv6 trials. These carriers will give IPv6 addresses to their new customers, but it will be a long time before they upgrade all of their existing customers to IPv6. So content providers must support both protocols for the foreseeable future.

"The content side is the easy side of the problem. The harder question is: How soon will you have a massive amount of IPv6 clients who need to get to you?" Malan says. "Think about the Linksys modem in your house. There are oodles of crusty old stuff out there that needs to get upgraded. That problem is hard and expensive."

Experts agree that CIOs need to tread carefully where IPv6 is concerned. For now, they only need to worry about IPv6-enabling their public-facing websites and Web services. They don't need to worry about upgrading anything behind the firewall on their private corporate networks.

The drop-dead deadline for IPv6

When do a company's public-facing websites and services need to be IPv6-enabled in order to prevent them from being unreachable to Internet users with IPv6 addresses? Nobody knows for sure when a significant number of IPv6-only users will emerge, but experts say this upgrade needs to be done within the next 18 months.

John Curran, president of the American Registry for Internet Numbers, which doles out IPv4 and IPv6 addresses to network operators in North America, has said the drop-dead deadline for U.S. companies to

support IPv6 on their websites is Jan. 1, 2012.

"It needs to be a priority by the end of the year," Brocade's Hankins agrees. "That coincides with ARIN running out of IPv4 space by the end of the year or early next year, and it also coincides with LTE deployment. LTE is one of the major drivers for IPv6 because they are expected from the beginning to use native IPv6 support in terms of having users access online processes."

The U.S. federal government has established Sept. 30, 2012, as its deadline for all public-facing government websites to support IPv6. Federal agencies have a second deadline of Sept. 30, 2014, to upgrade internal client applications that communicate with public Internet servers to use native IPv6.

Alain Durand, director of software engineering at Juniper, says CIOs have at most 18 months to get their Web content ready for IPv6-only customers. Juniper offers a special-purpose website for IPv6 users — ipv6.juniper.net — today, and it supported IPv6 on its main website — www.juniper.net — for World IPv6 Day using its own routers and carrier-grade NAT gear that it calls translator-in-the-cloud.

"Starting to introduce IPv6 and starting to turn it on now would be a reasonable thing to do," Durand says, pointing out that most broadband providers will support both IPv4 and IPv6 for awhile into the future. "In the beginning, IPv6 may go through some sort of NAT, then IPv6 may go native and IPv4 will go through some sort of NAT. The question for CIOs is: When can they offer a better service to their users by offering content natively over IPv6? ... There comes a point at which offering content over IPv6 offers a better user experience to customers and offers you as a network manager more flexibility."

Durand says he doesn't know when CIOs will experience traffic management issues on their networks that will encourage them to switch from NAT devices to native IPv6. One worry is that it will be harder for network operators to filter out denial-of-service (DoS) attacks when NAT devices are used to share IPv4 addresses among multiple subscribers. That's the kind of network management issue that will likely prompt network operators to deploy native IPv6 service.

"If you're using IPv6 natively or translator-

in-the-cloud, you have access to the originating IP source and you can filter out the DoS attack on this IPv6 address and only remove the bad guy without impacting the other 99 or 999 users," Durand says.

The cheapest, easiest route to IPv6

Experts say CIOs only need to upgrade their public-facing websites and services to support IPv6 in the near term. How long that will take and how much it will cost depends on the size and complexity of a company's Web presence.

Major content providers like Google and Yahoo are upgrading their entire Web server infrastructures to support IPv6, including Web servers, database servers, storage, caching and all the software that's used on these systems. Yahoo has been working on IPv6-enabling its infrastructure since 2008 and has said this is the second-largest engineering effort for its IT department, behind ongoing tech refresh efforts.

CIOs with smaller websites are likely to choose an easier approach: adding an appliance such as a proxy, gateway or NAT device to convert IPv6 traffic into IPv4 for accessing IPv4-based content. With these appliances, companies don't have to upgrade their Web server infrastructures but they will need to upgrade their network perimeter and routing infrastructure to support IPv6 and they may need to support transit peering for IPv6.

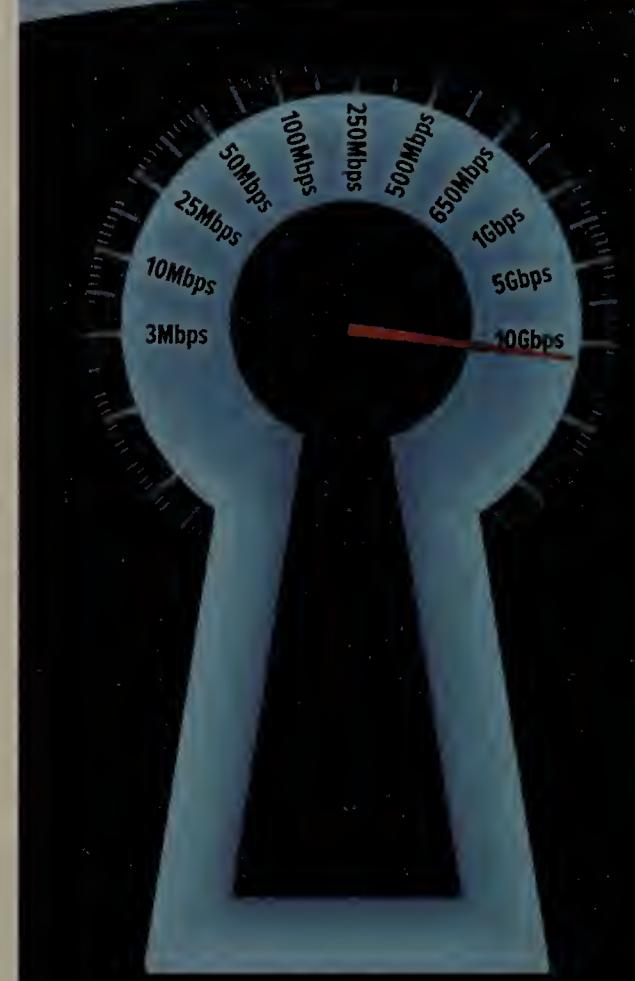
The appliance approach is gaining popularity. Brocade uses its ServerIron ADX Server Load Balancer and Blue Coat uses its IPv6 Secure Web Gateway to support IPv6 on its website. For World IPv6 Day, Cisco used its prototype ACE Session Load Balancer, Juniper used its translator-in-the-cloud offering and A10 used its AX Series appliances.

Enterprises can expect to spend tens or hundreds of thousands of dollars deploying these appliances at the front end of their websites to support IPv6, depending on the scale of their websites.

Using A10's AX Series Appliances with Server Load Balancing-Protocol Translation to support IPv6 on a corporate website will cost a company "anywhere from \$15,000 to \$200,000, depending on the performance that they need," says Paul Nicholson, A10's director of product marketing.

An alternative is for CIOs to outsource their Web content delivery to a service provider like Akamai or Limelight Networks, both of which are developing commercial-grade IPv6-based services in the cloud. DNS and hosting providers also may provide these translation services for IT departments on an outsourced basis. ■

More online: 6 simple steps toward IPv6. tinyurl.com/5wj5yrg



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► **Cisco, from page 1**

"We're structuring Cisco to be leaner, drive innovation faster," Chambers told the customer audience. "We've got to be easier to do business with, include you in driving our product direction, share our road maps, have an easy-to-use product portfolio. But innovation is the buzzword on where we're going to go."

To get there, though, Cisco is expected to cut between 5,000 and 10,000 jobs beginning in August, the first month of its 2012 fiscal year (Cisco's biggest workforce reduction to date took place in 2001 when it let 8,000 people go during the dot-com bubble). Cisco has lost share and profits in switching, and its foray into consumer electronics has been disappointing.

Many blame Cisco's current problems on ambitious incursions into 30 or so adjacent markets through 145 acquisitions over two decades that distracted the company from its core routing and switching business. Cisco also had a bloated management structure that stalled decision making, delayed product development and slowed the company's progress.

The upheaval still to come at Cisco did not dilute the company's mission at Cisco Live! The company announced the most significant upgrade in years to its most successful switch — the Catalyst 6500. Cisco also enhanced its data center and cloud portfolio with extensions to its Unified Computing Systems blade server chassis, its WAAS WAN acceleration appliances and its IronPort security line.

The 12-year-old Catalyst 6500 got a new Supervisor 2T routing and switching engine which doubles the switch's per-slot capacity to 80Gbps. It was a curious announcement as Cisco had cited Catalyst 6500-to-Nexus 7000 switch migration and transition as a factor that eroded profits in its fiscal second quarter and helped set in motion the restructuring that Cisco is now facing.

Some viewed the announcement as an attempt by Cisco to backpedal on the Catalyst/Nexus transition in an effort to preserve profit margins in switching, or as an indication that Nexus was meeting some resistance in the \$42 billion Catalyst 6500 base.

Cisco said it's merely a case of the market "bifurcating" into separate requirements for the enterprise campus vs. the data center.

"It takes different technology," said John McCool, Cisco senior vice president and general manager of the Core Technology Group. "We'd be silly to walk away from that installed base and loyal set of customers."

It also gave Cisco an opportunity to take another swipe at bitter rival HP. Indeed, if Cisco was preoccupied with the impending layoffs it did not show in the feistiness

with which it positioned the Catalyst 6500 Sup 2T against HP's A9508 switch.

"What kind of innovation have we seen come out of HP?" asked Scott Gainey, Cisco director of marketing for Unified Access Solutions. "The competition is on notice: Cisco does intend to compete and we intend to compete aggressively."

HP responded in kind, noting that Cisco was misleading the industry and its customers in comparing the Sup 2T to the A9508.

The UCS enhancements are an effort to enhance the scalability and performance of the data center consolidation system. Cisco added new fabric interconnects, a virtual interface card, a chassis I/O module and an update of its UCS management software to the UCS portfolio.

The extensions are intended to address challenges IT managers face in adopting virtualization, controlling costs and scaling to meet growing business demands.

But in addition to significant product announcements, the Cisco Live! conference also tackled some thorny issues that customers face. While Cisco is pushing hard on developing and selling equipment to support the growing amount of video traffic in IP networks — 91% of IP traffic will be video by 2014, the company claims — it intimated that video may not be ready for the cloud, and vice versa.

Network topology issues may preclude enterprises from posting internally sensitive videos to a cloud service like YouTube, says Guido Jouret, Cisco's vice president of enterprise video and CTO of emerging technology.

Cisco Cloud CTO Lew Tucker hosted a panel of users, integrators, equipment manufacturers and service providers to discuss if enterprises in general are ready for the cloud. The panel concluded that several wrinkles regarding software licensing, SLAs, cost-effectiveness, reliability, trust in the cloud provider, auditing and transparency, standards and interoperability, data privacy, and whether business critical applications can truly be migrated to the cloud need to be ironed out before cloud computing can capably replace a private IT infrastructure.

Harris Corp. used the analogy of airline reliability in assessing cloud reliability.

"Cloud has to do IT delivery cost-effectively, but also do it with safety," said Wyatt Starnes,



We will make faster decisions and be a more focused execution machine."

JOHN CHAMBERS, CEO, CISCO

vice president of advanced concepts and cyber integrated solutions for Harris Corp.'s Government Communications Systems Division. "There are five orders of magnitude difference in business maturity (between the airline and IT industries): Nine or 10 9s on passenger safety for airline industry" vs. five 9s for computing. "Our measure for successful cloud delivery should not be compared to data centers; it should be compared to the airline industry."

Cisco CTO Padmasree Warrior tackled, among other topics, the issue of whether customers want and can benefit from a single-vendor network vs. a multivendor implementation. Cisco, by pushing end-to-end network architectures, is a huge proponent of the single-vendor approach as it enhances security, reliability, multidevice interoperability and quality of service, the company claims.

This philosophy has been taken to task by industry pundits who claim that single-vendor networks neither lower total cost of ownership nor simplify operations.

Cisco also used Cisco Live! to showcase some data center customers that are local to Las Vegas. The press toured an innovative data center that patented its own power and cooling technique for a 400,000-square-foot, 100-megawatt, highly secure colocation facility just off the Vegas Strip.

So despite the gloom of the imminent layoffs, Cisco did not lose a beat at its annual customer confab.

Said Chambers: "Where will we be two to three years from now? The leader in our five company priorities, faster on innovations, simplified, leaner, your trusted networking/IT and business partner. We will make faster decisions and be a more focused execution machine." ■

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No IT? No offices? No problem for this virtual firm

BY TIM GREENE

WITH NO official corporate office or IT staff, the 30 full-time Gurnet Consulting consultants have become some of the industry's ultimate power cloud and social networking users.

Consultants within the firm, which specializes in IT project management, depend almost exclusively on cloud applications such as Google Apps and Salesforce and social media such as LinkedIn and Twitter to collaborate with each other and build key professional networks.

Founder and CEO of the firm Martin King says the company's virtual infrastructure lets the company run lean and quickly adapt new tools as they become available in the cloud. It also gives the consultants the social glue they need to operate effectively as a team. "We don't have offices where we can talk around water coolers," King says.

The company starts by using Yammer to draw its consultants together on projects and in personal relationships that help build a corporate culture in the absence of a face-to-face business environment. And it uses cloud applications Salesforce and Jobscience to track customer engagements and keep an eye on a pipeline of prospective new consultants the firm might need to hire for specific projects.

In combination with Google Apps for business applications, the company has all the platforms it needs to do business, eliminating the need for IT infrastructure except for laptops and smartphones, King says.

Google Apps and more

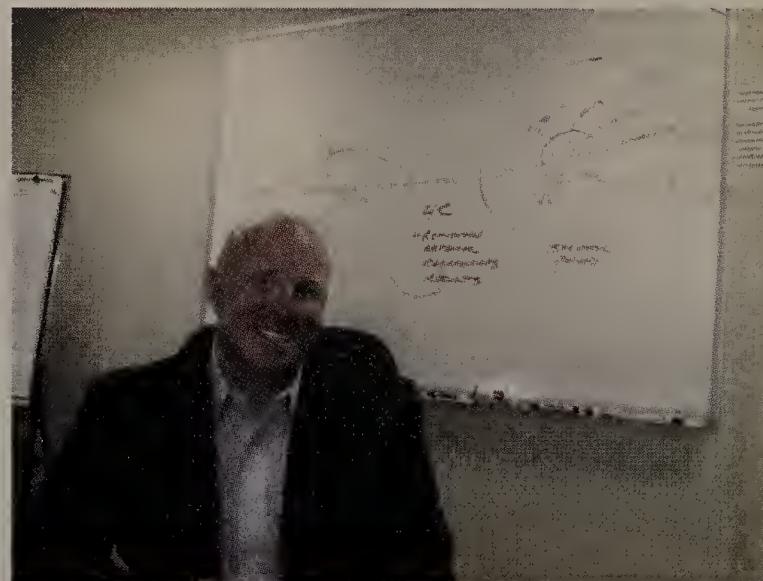
For its core business Gurnet uses Google Apps for calendaring, contacts, instant messaging and video calls, word processing, spreadsheets, slideshows and knowledge management. Salesforce.com provides collaboration on documents such as proposals, statements of work development and organization of document collateral for proposals. Job proposals developed in Google Docs are linked to job opportunities in Salesforce. Jobscience facilitates recruiting and workflow.

Gurnet is an IT consulting company that helps its clients develop and manage IT infrastructure projects. That requires a lot of attention to details, such as whether the client businesses have the personnel, infrastructure and systems to go ahead with

projects, and if not, how to get them.

Gurnet also helps write RFPs, choose vendors and formally assure that projects will be completed successfully, then helps clients bring the newly completed projects into routine use.

That range of work requires a lot of collaboration and a pragmatic way to achieve it and keep it organized. That pragmatic approach embraced cloud services, and will likely result in expanded cloud services, King says.



Martin King, founder and CEO of virtual firm Gurnet Consulting, relies on cloud services and social networking to keep his company running.

For example, currently the firm uses spreadsheets to correlate data about skills needed by clients that is housed in Salesforce.com with data about job candidates that resides in Jobscience. The spreadsheets work, but creating them is a time-consuming manual process.

As the firm grows, that process will become too big a burden. The solution will likely be upgrading Salesforce and Jobscience licenses so the two services can be integrated. "That will mean exponentially higher license fees, but it's better than buying server and having to maintain them," he says.

It helps too that Google Apps, Salesforce and Jobscience all offer limited free services or trials that are attractive financially, and they promote experimentation with new ways of doing things. Because they are cloud-based, trials can be set up quickly with no infrastructure demands on Gurnet, King says. "We can do rapid prototyping and make a call on it pretty fast," he says. A three-month free trial of Yammer, for instance, led to Gurnet purchasing the service.

While King likes the flexibility and economy of cloud services, he does worry some about availability. But he has faith in the providers,

taking their size and popularity as indicators that they deliver highly reliable services. "We're playing with the big boys in the industry so I'm not too worried about it," he says.

Putting these cloud-based collaboration tools in the hands of his consultants coupled with the ease of use of the applications has had good results, although not always predictable.

Yammer serves to share personal information among the consultants in order to create a closer social bond. King, for example, posted family photos from his Fourth of July vacation.

But it is also used to share ideas and issues consultants face when working on client problems. They see each other's posts and comment, sometimes generating ideas that result in effective professional strategies.

For instance, one consultant working with a client on merger/acquisition due diligence and another consultant working on a unified data warehouse for a client with 36 different business units found via their Yammer posts that they shared similar problems. Both were using tools and techniques to onboard data from disparate businesses. Yammer helped the consultants realize they

had something in common and to provide a forum for sharing, King says, ultimately resulting in better outcomes for clients.

Beyond cloud services, King also promotes use of social networking: It's mandatory for consultants to have LinkedIn and Twitter accounts, and Facebook is encouraged. King says he has even won useful feedback and connections from posts he has made about articles he was reading on his Kindle e-reader.

Gurnet's use of social networking is also a business development tool. A comment King posted on LinkedIn elicited a response from an IT executive at a retail chain that led to a chat and then to an in-person meeting and ultimately a work engagement.

The social networks also provide a reservoir of professional experts that Gurnet can tap when outside expertise on client engagements is required.

The firm has also referred potential clients to members of its social network-based professional stable when it lacked the expertise they were seeking. Gurnet didn't get a contract, but the referral generated goodwill, he says. ■

Verizon's center is like a 4G Tomorrowland

BY BRAD REED

HAVE YOU ever gone to Tomorrowland, the Disney theme park that dazzles you with tantalizing glimpses of what future technology will bring? Well, that's sort of what Verizon Wireless was shooting for at its LTE Innovation Center debut exhibition last week.



During both the opening ceremonies and the exhibit tours, Innovation Center representatives showed off several new products that utilize Verizon's LTE wireless network to make life just a wee bit more convenient (early tests of commercial services have shown LTE download speeds in the 7Mbps to 12Mbps range, although these speeds are likely to decline once more users subscribe to the services).

The LTE Innovation Center, located in Waltham, Mass., is meant to be a collaboration hub where startups can get advice and technical know-how from the pros at Verizon and its equipment partners. In other words, if you're a young company that knows nothing about LTE but would like to incorporate it into your product to give it more mobility, you now have a place to go.

During a panel discussion, representatives from three tech companies talked about how LTE had added an element of mobility to their products that exceeded anything they could have had with Wi-Fi. Bob Kingle, the CEO of LiveEdge, said that LTE was the key to letting his company create television news cameras that could broadcast from anywhere on the spot without having to wait around for a satellite truck. He also said that his company would never have survived if he didn't get hands-on help from Verizon, Alcatel-Lucent and Ericsson.

"I was looking at mothballing the company because we just weren't there and the technology wasn't there," he explained. "But we have the good fortune to run into Verizon and Ericsson and the Innovation Center ... we now have a product that NBC and CBS and Fox desperately want to change their cost structure and to democratize live news gathering."

Tim Root, CTO of VGo Communications, explained how LTE made it possible for the company to mount a teleconferencing service on top of one of its mobile robots that gives people the ability to simulate moving around a room during a videoconference. As an example, he cited a boy who had an immune disorder that prevented him from attending school in person. The school gave him some help by installing a VGo telepresence robot in the classroom and letting him attend classes through the robotic interface. Root explained that this added mobility was something that only could have been accomplished with a high-bandwidth wireless network with sufficient range to ensure constant connectivity.

One of the most striking uses of LTE at the demonstration came in the realm of transportation, as the team at the center has put together prototype cars and bicycles that incorporate the technology into their standard functionality. In the case of the bicycle, the team is experimenting with having a webcam strapped to the front of the bike while having another webcam and monitor attached to the handlebars, facing the rider. So if parents need to see where their children are or if they need to call them home, the parents can now do so using a home interface that connects with both cameras. ■



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► Microsoft, from page 1

database and VMware's virtualization are overpriced, Turner said.

But Microsoft's Worldwide Partner Conference in Los Angeles didn't focus just on competitors. Microsoft talked about upgrade paths from existing products and previews of upcoming ones such as Windows 8 for the desktop, Windows Server 8, a Skype-powered Lync communications suite and the next version of SQL Server.

Once Microsoft completes its \$8.5 billion purchase of Skype, the consumer-focused chatting and calling service will be heavily integrated with the business-focused Lync unified communications software, Ballmer said.

"One of the great motivations in acquiring Skype is to enable the enterprise to have all the control it wants in communication and collaboration through Active Directory and Lync, and yet be able to connect people within enterprises to consumers, businesses and trading partners around the world," Ballmer said. "Lync...with Skype is a strategy that will allow the consumerization of IT to really proceed with full vim and vigor."

Microsoft also talked up the future of Windows. Any desktop PC capable of running Windows 7 will be upgradable to Windows 8 because Microsoft plans to keep hardware requirements level or even lower them, the company said.

Despite strong Windows 7 sales, Windows XP is still the most widely used operating system, and Microsoft has consistently told businesses it's time to move off the OS, which will no longer be supported after April 2014.

Windows 8 will be optimized for both PCs and tablets, and Microsoft pledged that Windows 8 tablets will be able to do virtually anything a PC can do, perhaps a differentiator from Apple's iPad, which uses a different operating system than Mac computers.

Microsoft previewed Windows Server 8, which will feature upgrades to the Hyper-V virtualization platform. Reliability will be improved because of a new Hyper-V replication service that makes it easier to replicate virtual machines hosting databases and other applications to remote data centers.

"Hyper-V Replica works with any server vendor, any storage vendor, any network vendor, making it the ideal platform to deliver new service offerings," virtualization program manager Jeff Woolsey said. "With Windows Server 8 we're delivering massive, massive scale in the box, and we're delivering

mission-critical reliability enhancements."

Release dates for Windows Server 8 and Windows 8 haven't been revealed, but Microsoft said it will provide further previews of their capabilities in September at the company's Build conference in Anaheim, Calif.

monitoring and diagnostics across Windows, other platforms and Windows Azure," Microsoft said. "Operations Manager will fully integrate technology from the AVIcode acquisition for monitoring and deep insights into applications."

Microsoft's private cloud software is designed to connect with its public cloud known as Windows Azure. Azure lets customers build applications to be hosted in Microsoft data centers, but lags rivals Amazon EC2, Google App Engine and Salesforce's platform cloud in adoption.

At the conference, Microsoft also announced an expansion of the cloud-based desktop management service Intune, with enterprise-focused features such as the ability for administrators to distribute and install third-party software

across their systems. Microsoft also provided an update on its strategy for cloud-based ERP and CRM software.

The next update of CRM Online will be available in the fourth quarter, and customers with more than 100 seats will be able to get unified billing and provisioning for CRM Online and Office 365, the recently launched cloud productivity suite. CRM Online is also getting a social media makeover with the addition of real-time activity feeds that can be tracked both within the application and on Windows 7 mobile devices. On the ERP front, Microsoft plans to allow its Dynamics ERP software to run on the Windows Azure cloud.

Despite this breadth of offerings, Microsoft has lost some of its luster to rival Apple, which passed it in market cap, profit and revenue. Redmond's partner conference gave it the opportunity to boast about the numbers that show Microsoft is still growing.

Windows 7 has sold 400 million licenses in less than two years, Office 2010 has sold more than 100 million licenses, 50,000 businesses have trialed Office 365 since the cloud service's launch in late June, Windows Server locked up 75% of quarterly hardware shipments, and usage of the Bing search engine has tripled in the past year.

The only disappointment Ballmer mentioned was Windows Phone 7, but he claimed the future is bright.

"Phones: We've gone from very small to very small but it's been a heck of a year," Ballmer said. "You're going to see a lot of progress in that market." ■

SQL Server and System Center 2012 were also on the agenda at the Worldwide Partner Conference. Along with the next version of Windows Server, these products will provide the foundation of Microsoft's private cloud technology.

Microsoft server and tools chief Satya Nadella promised that System Center 2012 will work with multiple hypervisors and multiple guest operating systems, "because we recognize customers are going to be heterogeneous."

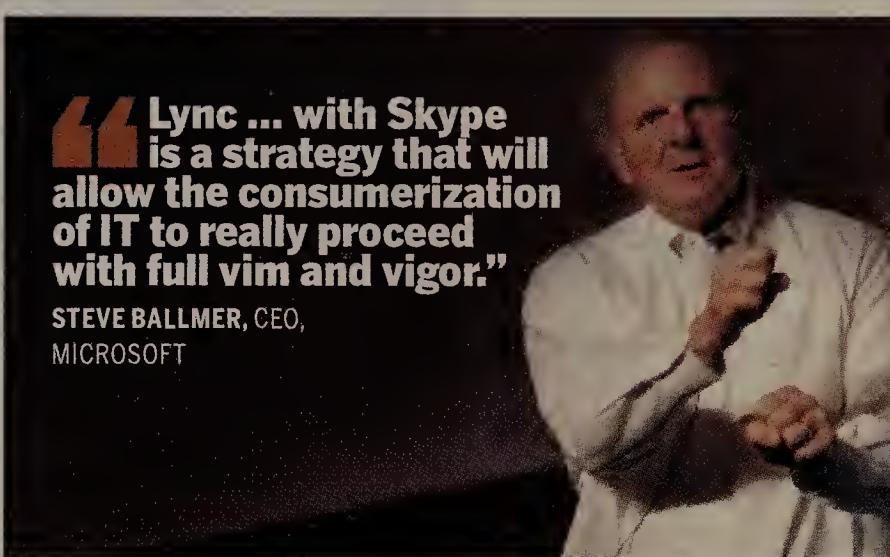
Microsoft launched an updated beta of Denali, the next version of SQL Server. This is the third beta since last November when it issued the first preview of Denali, which will replace SQL Server 2008 R2.

The release of the latest beta marks the first time "customers can begin testing ... features ... including SQL Server AlwaysOn and Project 'Apollo' for added mission critical confidence, Project 'Crescent' for highly visual data exploration that unlocks breakthrough insights, and SQL Server Developer Tools, code-named 'Juneau,' for a modern development experience across server, BI and cloud development projects," Microsoft said.

System Center 2012 will feature App Controller, formerly known as "Project Concero," to give IT managers greater control over applications across public clouds and their private data centers, and application managers a self-service interface to deploy and manage applications.

Microsoft is also opening a beta for an Operations Manager capability in System Center 2012.

"Operations Manager is a key component that provides end-to-end application service



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TOOLS

My iOS love affair

My love affair with iOS devices (in other words, the iPad 1 and 2, the iPhone, and the iPod Touch) continues apace. I keep finding new iOS-related products that are really useful and many that are both useful and cool.

In the latter category, for example, is Microsoft's free Photosynth, a system for creating photographic panoramas. But rather than displaying the captured scene as one superwide image, Photosynth panoramas are displayed in a more regularly sized window and using your mouse or cursor keys, you can pan around and zoom in and out of the image providing a more realistic rendering of a scene.

While you can upload a series of overlapping images from any camera to the Photosynth site and then have them "stitched" into a panorama, the iOS versions detect the overlaps between adjacent images as you take them and stitch the panoramas together without having to use the online service. You can also upload the panoramas or a specific view from one directly to Facebook when your iOS device is connected to the 'Net.

While you might think of this app as more of a hobbyist tool it offers unique communications opportunities in disciplines such as architecture, realty and engineering. Photosynth for iOS gets a rating of 5 out of 5.

While I'm on the subject of visual apps, I've been testing Splashtop Remote Desktop.

A remote screen viewer for iOS, Splashtop can stream the desktop image from OS X and Windows hosts to iPads and iPhones (Android and HP webOS versions are also available) and the connections can transparently traverse firewalls.

The visual results are very good with options to scale the remote screen to the iOS screen or keep it full size and pan the remote image. The rendition of the remote desktop

is excellent and glitch-free (I saw no "stuttering" as the remote screen updated which is something that some competing products suffer from).

Splashtop supports multitouch gestures for remote screen navigation and provides an extended onscreen keyboard (though if you're using a physical keyboard with your iOS device, Splashtop ignores it).

One thing that didn't work at all was sound despite the Splashtop specs



Mark Gibbs' Gearhead

because it is a new, and, as yet, unreleased device: The Kingston Wi-Drive.

The Wi-Drive provides extra storage for iOS and other smartphone devices at a price that makes buying, say, a more expensive iPad to get more storage kind of silly.

Due to ship at the end of July, the Wi-Drive will be priced at \$130 for 16GB and \$175 for 32GB. At 121.5mm x 61.8mm x 9.8mm the Wi-Drive is smaller than an iPhone and has a rechargeable battery that gives about four hours of use.

What's really neat is that the Wi-Drive not only provides secure 802.11n Wi-Fi access to its onboard storage for up to three devices but also acts as a Wi-Fi relay to provide access from the connected iOS devices to another Wi-Fi service.

So far I'm pretty impressed. Running prerelease firmware, the Wi-Drive's performance is very good and its companion iOS application is stable and straightforward to use. Once I have the final, shipping Wi-Drive firmware, I'll provide a more extensive review. For now, the Wi-Drive looks very promising. ■

Gibbs is well-padded in Ventura, Calif. Access him remotely at gibbs@gibbs.com.

The Wi-Drive provides extra storage for smartphones.



claiming that audio sent from the remote host will be reproduced on the iOS device. I couldn't get audio to work at all with either Windows Vista or OS X as the remote system.

The Splashtop app, priced at \$1.99, gets a rating of 3.5 out of 5.

My final product is, I admit, a bit of a tease



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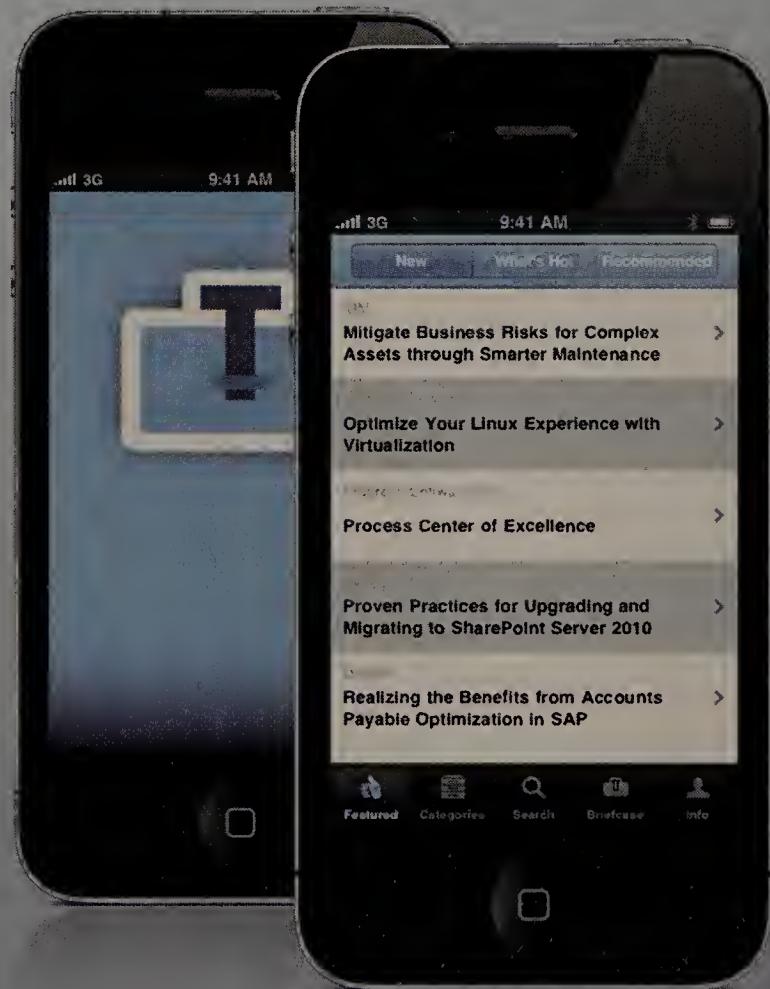
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HP webOS

GADGETS

HP TouchPad joins the tablet race, but has some catching up to do

THE SCOOP

TouchPad

by HP, about \$500 (for 16GB; 32GB costs \$600)

► **What it is:** HP's entry into the consumer-oriented tablet game, the webOS-enabled TouchPad features a 9.7-inch, LED backlit display, Wi-Fi connectivity, choice of 16G or 32GB of storage space.

► **Why it's cool:** The main selling point of webOS is its ability to handle multitasking — with this device, you can open multiple applications at the same time, and then flick back and forth with your finger to go back to what you were doing when you started the new app, etc. The ability to close an app by just flicking it away like a playing card is also a neat little trick. The device supports Adobe Flash, so you can view Flash-heavy websites such as YouTube through the Web browser instead of a separate app.

For business users, the TouchPad offers support for Exchange ActiveSync and VPNs, as well as over-the-air management and data security features (remote wipe, for example). The sold-separately HP Touchstone Charging Dock is very nice, creating a stand that can be used to view the TouchPad upright, and still inductively recharge the unit (no cables needed for the recharge).

► **Some caveats:** The TouchPad features a 1.2 GHz Qualcomm dual-core Snapdragon processor, but this seemed to make all of the apps run a lot slower than on other tablets I've tried, especially the dual-core A5-enabled iPad 2 (heck, even my older iPad ran apps faster). For example, loading and running the Facebook app via the TouchPad took several minutes (four-plus), and when my news feed did show up, it took longer to load up friends' icons and their photos. Even on a Wi-Fi network.

The TouchPad also suffers from fewer webOS

apps available than on the Android Market or the Apple App Store — and apps that are specifically aimed at the TouchPad are even more scarce. Sure, most of the basics are there, but users will have to be patient and hope that more apps will be developed for this device.

The lack of a rear-facing camera also is worrisome, putting it behind the iPad 2 and other Android tablets. The front-facing camera can be used for video calls, but you can't take photos or videos with it (at least, not easily). Other missing features include only 32GB of storage (compared to the high-end 64GB available with Apple), and no 3G/4G connectivity options — it's Wi-Fi only.

Even connecting to the Wi-Fi network was tricky — on initial setup, it wouldn't connect to my corporate Wi-Fi network, which requires additional authorization via Web browser. After going to my home network for the initial setup, the TouchPad could then connect to the corporate network, but specific apps still had a hard time detecting whether I was logged in or not. More often than not, an app would say that I wasn't connected and leave me hanging rather than bringing up a browser window in order to authenticate.

► **Bottom line:** As HP's first tablet to the market, it's not a bad piece of equipment, but when you compare it with what's also out there, the cracks begin to show. If HP can ramp up quickly with a second model that surpasses what's out there in terms of hardware and software (a tall order considering what's out there from Google and Apple), then HP has a horse in the race. If not, it's bound for the "just another tablet" pile.

► **Grade ★★★ (out of five).**

Shaw can be reached at kshaw@nww.com.



Keith Shaw's
Cool Tools

Layered security defenses: Which layer is more critical, network or endpoint?

Net layer delivers situational awareness



Eric Knapp, director of critical infrastructure markets, NitroSecurity

WHILE ENDPOINT SECURITY IS AN important component of a strong defense-in-depth posture, the network layer is more critical because it helps eliminate inbound vectors to servers, hosts and other assets while providing an excellent basis of activity monitoring that improves our overall situational awareness.

This is important because, while endpoint security has improved significantly with the introduction of application whitelisting and other technologies, our systems and devices are simply too diverse and too interconnected to ensure that host security can be deployed 100% ubiquitously and effectively. All it takes is a single chink in the endpoint security armor to create a beachhead for attackers.

Network security isn't a silver bullet either, of course. Even using unidirectional gateways (the network-layer equivalent to application whitelisting, where absolute protection is provided at the physical layer), there's the chance that a hardened network shell can be bypassed, exposing the gooey interior of networked hosts. However, the network is the common denominator, the nexus of all systems, applications and services. By properly monitoring it, the larger threats are detectable and the hosts themselves are ultimately more secure.

Active protection using standard network security devices such as firewalls and intrusion-prevention systems (IPS) is a start. Network activity monitoring using intrusion-detection systems, network flow analysis and more holistic systems such as network behavior analysis tools, log management and security information and event management (SIEM) systems rounds out point protection devices and provides a broader threat detection capability.

In other words, network-based security is more than just a layer of defense; it's a keystone to obtaining situational awareness, showing security analysts how all of those discrete host security events relate to each other and to the important security and compliance policies of the company.

When utilized properly, network-layer security information can be used in conjunction with application whitelisting on the host to create something

► See Knapp, page 22

Which layer is more important?

Network (80%)

Endpoint (20%)

Cast your vote and see comments at tinyurl.com/5vg6ydy

It all hangs on the endpoint



James Lyne, director of technology strategy, Sophos

see more than 95,000 individual pieces of malicious code every day and find a new infected Web page every few seconds, an astounding increase in quality and quantity of malware over previous years. The content-based detection techniques that have been used for the past 25 years are increasingly ineffective against this mass of malicious code. At the endpoint, visibility of the applications, data, behaviors and system health can be used to make more accurate decisions and better proactive protection.

Compare for example, the task of trying to identify and block Skype (say nothing of more tricky malicious code). At the endpoint

you simply identify Skype.exe (using a variety of mechanisms — not just name), whereas trying to achieve this in the network you need to decode the packets to find the interesting information within the packet, which can be exceedingly challenging given that there are thousands of different formats. Oftentimes these can be disguised as other forms of legitimate traffic.

More users are also accessing data and applications from the road, in many cases now directly from cloud services. If the traffic isn't backhauled through the business, network security loses visibility traditionally provided at the perimeter and the fabric of the network. Security capabilities like URL lookup for infected websites therefore need to be available wherever the device is. Endpoint and cloud-based protection allows this.

Network security is easier to deploy than

► See Lyne, page 22

► Knapp, from page 21

even better. The term "smart listing," first coined at a SANS Institute security conference in London, introduced the concept of using security events from application whitelisting agents on the host to complete the feedback loop to network security devices, which typically block traffic based on blacklists, or defined signatures that tell the firewall or IPS what we know is "bad."

When a zero-day exploit slips past these blacklist defenses and hit a host protected with some sort of application control, the exploit will be blocked and the details will (hopefully) be logged.

But where did that exploit come from? Was it an insider threat, or something more advanced originating from another country? The only way to answer those questions is to look at the network itself, specifically at the network-layer security events, as well as network flow information.

When we see something that is clearly of malicious intent attempting to execute applications on a protected host, we can intuit that the application is malicious and adjust our blacklists accordingly. In other words, we create a "smart list" of what we infer to be malicious, based upon intelligence obtained from the host, but assessed within the context of the network layer.

Only with this level of automated intelligence and network-layer awareness can the most sophisticated attacks be detected and then blocked at the perimeter using network-layer security controls. Because if the network lets the attack in, it will eventually find its beachhead: that one desktop, server, printer or some other device that isn't adequately protected.

There's a lot of covert, mutating and otherwise sophisticated malware available, so if an attack does successfully land it's going to gnaw away at systems until a weakness is found. When both network and host security are hardened, the resulting security Gobstopper is going to be difficult for attackers to chew on. ■

NitroSecurity provides both intrusion prevention systems as well as the only SIEM system to include integrated network-based application content and database transaction monitoring.

► Lyne, from page 21

endpoint security because companies can roll it out in a few places on the network instead of having to deploy on every individual PC. However, when security goes wrong and a device gets infected, endpoint protection offers the ability to clean up malicious code and reverse the damage or remediate problems, something network-layer security cannot do.

To be fair, being at the endpoint is a constant battle because a lot of malicious code is designed to disable endpoint security software. Inspection from the network does not have this problem. The good news: Malware at the endpoint can be detected as it attempts to infect others or dial home.

All in all, both forms of security are important to protect against the modern threat. Some security functions that were traditionally delivered at the network need to be transitioned to the endpoint for effective performance and compatibility with the new army of roaming users.

Conversely, network solutions can cover devices where agent deployment is not realistic, visiting guests or systems which might have had their endpoint software disabled by malware and where network-level attacks and snooping can more readily be identified.

With such a large quantity of malware out there and more targeted attacks, the more layers you run, the bigger the net you spread to catch cyber criminals.

Traditionally endpoint and network security have been handled as isolated areas by different teams. Increasingly, in response to broader threats and new devices, there are benefits in having them work together. Sharing information between the network, endpoint and cloud will be the direction of modern security. ■

Sophos is both an endpoint and network security provider. It believes that both layers are a necessary part of the solution and increasingly need to be joined up and work together to provide a more complete security solution.

→ **Send Debate Suggestions** to jdix@nww.com

Porthole view

→ First and foremost education is vital, teaching users not to click on something or give information out to a non-trusted source. I think that network slightly edges out endpoint in this debate, simply because the network is the way in and out and if you stop it there then endpoint doesn't need to matter as much. I say network also because Ethernet as a standard is the easiest place to start; with the endpoint you have to be concerned not only about the OS (patch level and version) but also what applications and what version of those applications; not forgetting social sites and social engineering — too many to attach vectors to protect. You have companies like OpenDNS that try to protect simply by using their DNS and I believe this is the future, a "cloud security"

if you will. Starting out and working in, encryption on many levels is a must. **ANON**

Is saying 'both' a cop-out?

→ Seems like there needs to be priorities based on likelihood of success: network, No. 1; apps, No. 2; endpoints, No. 3. But all of the above? Sure. The foundation is the network, though. Is this an opening/opportunity for network fabric? **PAUL CALENTO**

Back to first principles

→ Consider the Security Placement Principle: A security mechanism is most effective when it is placed as close as possible to, and under the direct control of the owner of, the asset that it protects. This is related to the End-to-end Principle

in networking. The point is that assets in endpoints should be protected by mechanisms in endpoints. That means hardening operating systems to prevent programs from being installed without explicit authorization informed by digital signatures, and to prevent any code from executing unless properly installed or confined to a sandbox. It means building applications that are secure. It also means enforcing policies, such as for use of file system protection and credentials. And it means extensive use of end-to-end network layer security mechanisms such as SSL. Mechanisms in the network that protect the endpoints are a Band-Aid. Assets in the network have to be protected by mechanisms in the network. Unfortunately, we have known how to build secure systems since the 1970s, but choose not to. Instead, we rely on Band-Aids. **ANON**



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Cloud-based services navigate the maze

Aerohive, D-Link and Meraki deliver enticing alternatives to on-site management

BY C.J. MATHIAS

The cloud is everywhere today, offering the possibility of all manner of IT functions on a software-as-a-service (SaaS) basis.

In this test, we looked at three companies that provide WLAN management services in the cloud, and we came away impressed.

Because of the mission-critical nature of network management and the fact that these tools have traditionally lived on-site, there is some understandable skepticism toward cloud-based WLAN management. But we discovered that cloud-based management offers an interesting path to reducing cost, improving productivity and offering a range of functions that otherwise would involve sizeable capital investments.

The idea of moving wireless LAN management to the cloud has proven so interesting that a number of vendors are now delivering these services. We tested three cloud-based offerings: HiveManager Online from Aerohive Networks, D-Link's CloudCommand and Meraki's Cloud Controller.

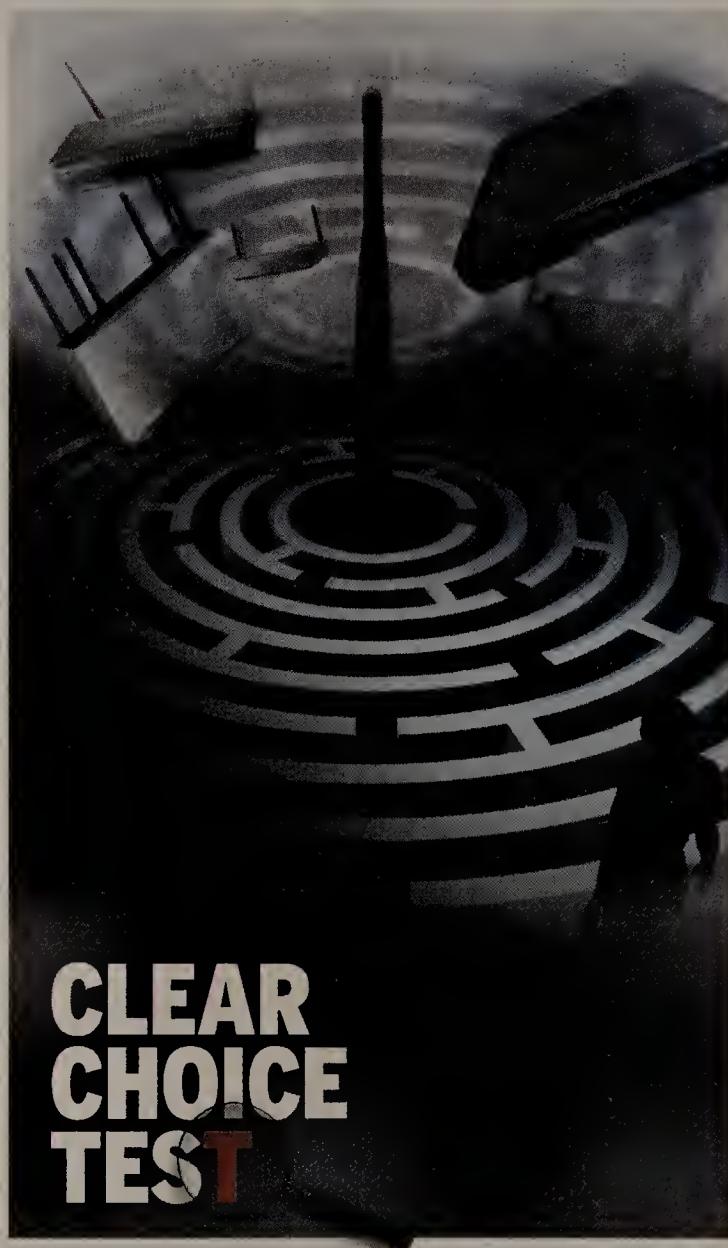
We wanted to find out if there is a compromise in capability between cloud and traditional WLAN management systems. What do the economics really look like? And could cloud capability literally move the network operations center into the palm of one's hand?

WLAN management: From nice-to-have to vital

Traditionally, WLAN management functions in enterprise-class products have been implemented either in a WLAN controller or in a separate appliance or server (virtual or otherwise), or sometimes, both. Small-to-midsize business products usually involve configuring firmware in each access point involved, via a secure-HTTP interface.

An effective centralized management console should be capable of performing all required functions across the entire network, no matter how large or distributed, easily exporting all key interfaces and intrinsic facilities.

Moving the management system into the cloud isn't as big a departure as it might initially seem. Eliminating the need for local hardware (usually accessed via the browser-



based client, as is required with the cloud) doesn't seem like it should be a big deal, and other mission-critical functions have gone the Web/cloud/SaaS route.

So, just how good are cloud-based wireless-LAN management systems? Is there any compromise in functionality? Can they perform in mission-critical settings? And do they represent a viable strategic direction for what is, again, a vital function?

Test parameters

The evaluation process in this case was a bit different from the typical *Network World* test, in that no throughput testing, functional verification or other benchmarking was performed. Rather, we compared features by examining the capabilities of each product, using a live installation. The results are assembled in a table, which appears online at tinyurl.com/5ux29rw.

We also noted what we liked — and didn't — about each implementation. The table is not

exhaustive — some of the products reviewed have literally hundreds of functions. But we wanted to make sure that an enterprise would be happy with the cloud service implementation in each case, so key functions are listed.

Each vendor was asked to provide two access points, the credentials necessary to access its cloud-based management service, documentation, pricing and any other materials appropriate to a product review. We approached this test as a customer knowledgeable in WLANs, but unfamiliar with the details of each product, with the goal of discovering features and capabilities through actual use.

Aerohive Networks, D-Link and Meraki, all firms with a significant presence in the WLAN space, agreed to participate. All of the cloud-based management consoles run within a browser, and for this test we used Internet Explorer 8 running on Windows XP.

The test strategy was simple: For each vendor, we pretended to be novice customers deploying a WLAN for the first time. We followed vendor recommendations and documentation (as available) closely, noting any issues or problems as we went. We then walked through all of the facilities for each console, assembling the features table and noting any interesting items.

We verified all Wi-Fi settings using Fluke Networks' AirCheck handheld Wi-Fi Tester, which was a very convenient tool. We need to point out that while comparing different consoles on their feature set makes sense for the purposes of this comparative review, customers should not make buying decisions based on features alone.

A buying decision would also involve the selection of access points, so additional parameters come into play. While we believe that management functionality is rapidly becoming a key differentiator in WLAN offerings, it would be wrong to conclude at this point that any purchasing decision would be gated solely by such.

Overall test results

Each service has its own strategy and emphasis, but we found no degraded performance and concluded that there is no reason, based on available capabilities, that a cloud-based WLAN management system could not completely replace a local implementation.

Each product was easy to use and responsive, and while functionality varied significantly, all could handle at least the basic functions essential in enterprise-class WLAN operations.

All of these services are priced by the year on a per-access-point basis, with pricing as low as \$4.75 per month per access point (Aerohive). While the analysis of a specific case is required for an ultimate determination of value, the cost differential between a local implementation and using a cloud-based service could be significant. We've seen cases where the cost reduction afforded by the cloud actually paid for the remainder of the system itself.

Aerohive HiveManager Online

Aerohive suggests getting started with HiveManager Online (which we, like Aerohive, will refer to as HMOL below) via a 25-minute online video that covers all the basics.

The video is entertaining and informative, and this is indeed a great place to get rolling with HMOL. It's easy to skip over the parts that don't apply to a particular situation. We also reviewed a very complete set of documentation, which included a Reviewer's Guide that is sent as part of a customer evaluation. Oddly, though, there is no manual.

Two of Aerohive's HiveAP 320 access points were connected to our LAN, and we fired up the HMOL console. The required credentials are provided via email. But it's basically plug in the access points and log in to HMOL. A little parameter setting (password, time zone, etc.) and you're ready to go.

HMOL provides exactly the same functionality as HiveManager running on a local server or appliance and, as such, is designed to manage large-scale, enterprise-class deployments.

HMOL comes in Express Mode and Enterprise Mode, which can be thought of as beginner and advanced. Express Mode, despite its name, offers a very robust set of functions and that's the place to start.

We made a cursory pass through Enterprise Mode, noting that settings applied in Express Mode carry over to Enterprise Mode, but not the reverse — so be warned that switching back isn't an easy task. And the differences between the two were fairly minor regardless.

The most important function in a WLAN management system is to configure access points, SSIDs and related security items. This is all very easy and intuitive in HMOL Express, reminiscent of "wizard" features

NETRESULTS

Product	HiveManager Online	CloudCommand	Cloud Controller
Company	Aerohive	D-Link	Meraki
Price	First year, \$95 per AP; three years, \$190 per AP.	First year included with purchase of APs; subsequent years, \$99 per year per AP.	First year, \$150 per AP; three years, \$300 per AP.
Pros	Easy to use, enterprise-scale, intuitive, broad range of features.	Simple, effective, best for SMB use.	Easy to set up, strong security, enterprise-grade.
Cons	Lack of a traditional user guide.	Limited features, limited documentation.	Documentation could be better.

that we've seen over the years in a wide variety of products.

Everything is easy, but it's possible to dig into very low-level settings if you wish, including setting access point transmit power, for example. Once you're done, upload the settings, reboot the access points and you're on the air. The Home screen in HMOL provides an overview of key operational status. As with all of the products reviewed here, our No. 1 wish would be the ability to customize this page to our specific preferences.

HMOL also excels at monitoring, with a wide variety of data available, including RF interference, radio channel, transmit power and noise floor, detailed event logs and a lot more. It's possible to upload floor plans and maps for complete documentation as well as operator visualization of access point locations. And, while all of this is very easy to use, the online help function is detailed and complete, at least partially compensating for the lack of a traditional user's guide.

Overall, we were impressed with the range and scope of function and, at the same time, how simple and intuitive the user interface is — one of the best we've seen.

D-Link CloudCommand

While D-Link is best known as a supplier of residential-class networking components, the company has a substantial presence in the SMB space. Its new DAP-2555 AirPremier N AP \$399 list is a dual-band product designed for business use and managed by CloudCommand, a cloud-based management console from PowerCloud Systems. PowerCloud is an OEM SaaS company, and CloudCommand is also available from a few other companies.

Setup is very easy — just plug in the access points, go to the D-Link CloudCommand website, register with contact info, enter UICs for each access point (on a label on the bottom of each), enter SSID, set encryption options and guest access preferences, name the access points and enter their location, review everything and press enter — that's literally it. The CloudCommand console is quite simple, with just a few tabs for a Dashboard snapshot view of settings, status and activity.

An interesting security option is to augment WPA2 with what PowerCloud calls Individual Device Authorization (IDA), a variant on the per-user key theme, in this case delivering credentials out-of-band via text messaging. Individual tokens are entered via the browser, and can be individually revoked as required.

We did notice that one of our test access points would not come online, and this situation, likely a defective unit, was correctly identified by CloudCommand. D-Link will replace any defective access points, of course, under warranty.

Somewhat curious, a review of a pre-release of the user manual for the DAP-2555 shows a very robust set of functionality, but little of this is currently exported via CloudCommand — and the option to enable full configurability and control is missing from the current firmware.

This means that it will currently be necessary to log in to each access point for detailed configuration — exactly what a centralized management console is designed to avoid. Again, D-Link is really just getting started here, so we expect that this mismatch will be corrected.

Overall, CloudCommand is a simple but effective management console that would be especially at home in smaller installations. And we anticipate that PowerCloud will be adding new features on a regular basis, although the big question is how quickly its OEMs will roll out new releases. The only other real issue relates to documentation — there isn't much besides an FAQ file, and there's only very limited context-sensitive help with no explanation of many items and options. We expect, based on conversations with company representatives, that this oversight will be corrected shortly.

Meraki Cloud Controller

Meraki was one of the firms that originated the concept of cloud-based deployment, and all of its access point products are provisioned via its cloud-based Cloud Controller service. Setup is a piece of cake: Via Meraki's secure site, create an account, enter your order number (sent by Meraki via a confirmation email at time of purchase) and you're in. The remaining configuration of security and related items is trivial. Interestingly, Meraki allows users to enter the location of access points on a map for quick reference later, a feature that could be very useful in widely distributed networks.

In fact, though, the entire console is very easy to use, with context-sensitive help and a crisp, logical layout. It's easy to find what you're looking for, but documentation could be better. Selecting the help tab ultimately results in a search that may produce a lot of irrelevant information — and it would be great if help popped up in a separate window (as is the case with Aerohive) so you could see the help and the screen you're working with at the same time. There is, however, a very complete manual available for download, along with many other useful documents.

Meraki includes a clever and easy-to-use facility to set up custom splash pages, which can include authentication (username/password) beyond 802.11's authentication. The product is exceptionally strong in security (VPNs, RADIUS and more), with numerous options for managing traffic flow and QoS, and even checking for virus protection on clients. The company also includes a way for users to "make a wish" for new features and improvements, an interesting idea. Our biggest wish, by the way, for all of these products is the ability to customize the user interface so as to ignore options we don't need and to customize the monitoring view for our preferences.

Meraki has steadily expanded its product offering with a line of routers, VPNs, Wi-Fi Hotzones and even systems management

(clients and servers), all managed from the cloud. As we saw with Aerohive, this expansion of the scope of cloud-based management really shows the power of the cloud-services concept when put into practice, and points to what could indeed become a cloud-centric future for all of network management.

Analysis and conclusions

All of the products here easily handle the basics of multi access point wireless network management — adding and configuring access points, monitoring for exceptions and reporting, and doing all of this reasonably intuitively. While the Aerohive and Meraki products are quite robust, even smaller installations looking for simplicity will be happy with any of the products — responsiveness was uniformly excellent in all cases, so a local server has no real advantage in this dimension.

Of course, your choice of management service, with the exception of CloudCommand, will be tied to specific hardware, so the management console alone is again unlikely to be the key differentiator here — but we believe that eventually management will become a key if not a gating item in system selection.

Cloud is indeed reminiscent of timesharing, harkening back to the era of mainframes and terminals. But we're clearly today dealing with more horsepower in networks, servers and software.

And the real issue is capabilities — services deployed cost-effectively, reliably and location-independently — not hardware. It's about the economics of the contemporary organization — minimizing capital and operating expense without compromising functionality — not having title to all of the required pieces.

Thus the shift: WLAN management is about fundamentally location-independent services, not products. As we've seen in the sampling explored here, the range of function is broad, the services responsive and simple to use, and each is clearly effective and worthy of further consideration.

The biggest argument against WLAN management in the cloud is with respect to reliability: What if your connection to the Internet goes down? What if the ISP or management services provider suffers an outage? In the event of such a failure, the lack of WLAN management capabilities is likely to be the least of your worries, as most other IT operations are also likely to be affected. And regardless, this challenge is addressed in the usual manner, through business operations continuity planning and related IT best practices.

With respect to the suppliers of WLAN

management services themselves, we asked the question of each supplier: Are your operations distributed enough and fault-tolerant enough to withstand even a challenge as great as that represented by the recent earthquake and tsunami in Japan? Each responded positively, with D-Link, for example, noting that CloudCommand is hosted on Amazon's EC2 cloud service. Of course, Amazon recently suffered an outage, but we are again talking about WLAN management, and it's unlikely that a temporary outage in management services will have an adverse effect on the enterprise.

Where do we go from here? It's pretty clear that our initial assumptions about no compromise in functionality and cost-effective deployment were correct. We're also seeing announcements from such firms as AirTight, which recently augmented its cloud-based WLAN security and assurance capabilities with access also managed in the cloud. (AirTight was invited to participate in this test but declined, citing scheduling issues.)

And WaveLink recently announced a cloud-based version of its well-known Avalanche platform, this one aimed at mobile device management. (WaveLink has also hinted at WLAN management in the cloud for the future.)

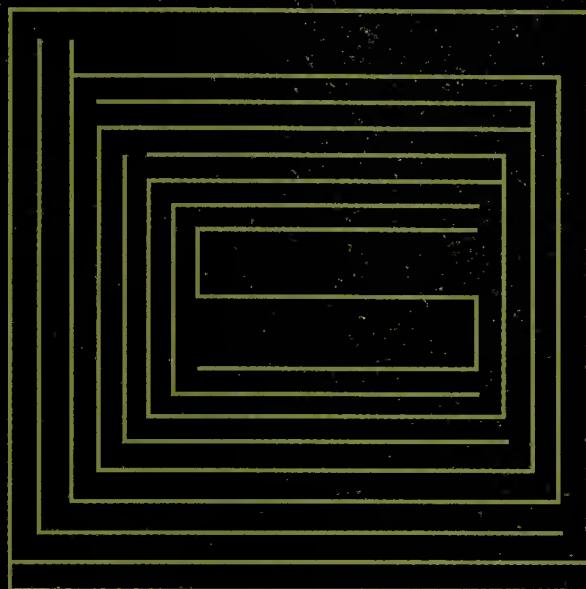
In addition, Enterasys enables its resellers with cloud-based wired and WLAN management capabilities in the Network Management Suite, and this angle is interesting, with the enabling of multi-tenancy an intriguing possibility for resellers everywhere. This shift in business models is almost as interesting as the technology, and we think both resellers and end users will look at cloud-based management as a viable if not the preferable option with a bit more exposure.

Indeed, it would be hard to imagine any showstopper with respect to cloud-based WLAN management. And it's easy to see how this model extends naturally and transparently to wired-LAN management as well. One need look no further than Meraki's new Systems Manager service to see how the cloud can extend into most if not all enterprise IT management functions. ■

Mathias is a principal at Farpoint Group, a wireless advisory firm in Ashland, Mass. He can be reached at craig@farpointgroup.com.

Go online for a table showing the feature set for each WLAN management service. <http://tinyurl.com/5ux29rw>

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Qwest is becoming CenturyLink.

Cisco powers up Catalyst 4500

New UPoE spec supplies 60 watts per switch port

BY DAVID NEWMAN

Cisco doesn't just want to sell you switches. It also wants to be your power distribution vendor.

New line cards for the Catalyst 4500 switches support Universal Power over Ethernet (UPoE), a means of supplying up to 60 watts per switch port. That's enough to power all devices in a cubicle, including a 23-inch monitor, thin-client computer and webcam-equipped IP phone.

We lit up all that gear in this exclusive Clear Choice Test, and also examined performance and features of a new Supervisor 7-E management module and an energy-efficient Ethernet line card that drops power consumption when idle. These transformed the venerable Catalyst 4500 from modular Ethernet switch to master power-distribution system.

UPoE differs from previous versions of PoE in that it uses all four pairs of an Ethernet cable to supply power, doubling the wattage available to UPoE-capable devices. Cisco's implementation is proprietary, but the vendor says it will bring this variant of the existing 802.3at specification to the IEEE for standardization.

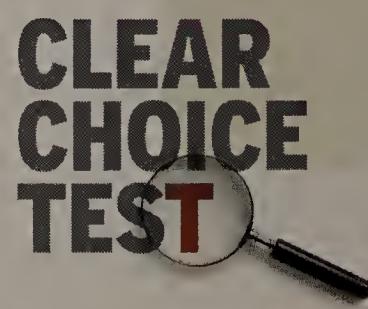
Cisco bolsters switches

The new WS-X4748-UPoE+E line card has 48 Gigabit Ethernet ports, 24 of which can supply UPoE power. We verified this by using Sifos Technologies' PowerSync analyzer to draw a full 60-watt load on 24 ports during all performance tests. UPoE had no impact on system throughput or latency, as measured with a Spirent TestCenter analyzer.

We also verified UPoE functionality by plugging in devices typically found in an office cubicle. For the phone and computer, we used a Cisco 9971 IP phone equipped with a webcam and embedded CVXC-2111C virtual desktop client. The latter is a thin-client computer that we used with VMware's Virtual Desktop Infrastructure (VDI). We also attached a 23-inch Samsung SyncMaster NC220 monitor over UPoE.

Finally, we attached BT Group's ITS.Netrix, a phone intended mainly for stock traders with up to 20 lines, four speakers and a video display. All these devices operated successfully using UPoE.

Two kinds of devices that won't work with UPoE, at least for now, are conventional notebook and desktop PCs. While they're getting more efficient, most laptop and desktop PCs currently draw well more than the 60 watts



supplied by UPoE. For example, this article was written and edited on an Apple MacBook Pro with an 85-watt power supply and a Dell OptiPlex desktop that can draw up to 590 watts. Even though actual power draw is usually far lower, 60 watts sometimes isn't enough for either type of machine.

Net management ABCs

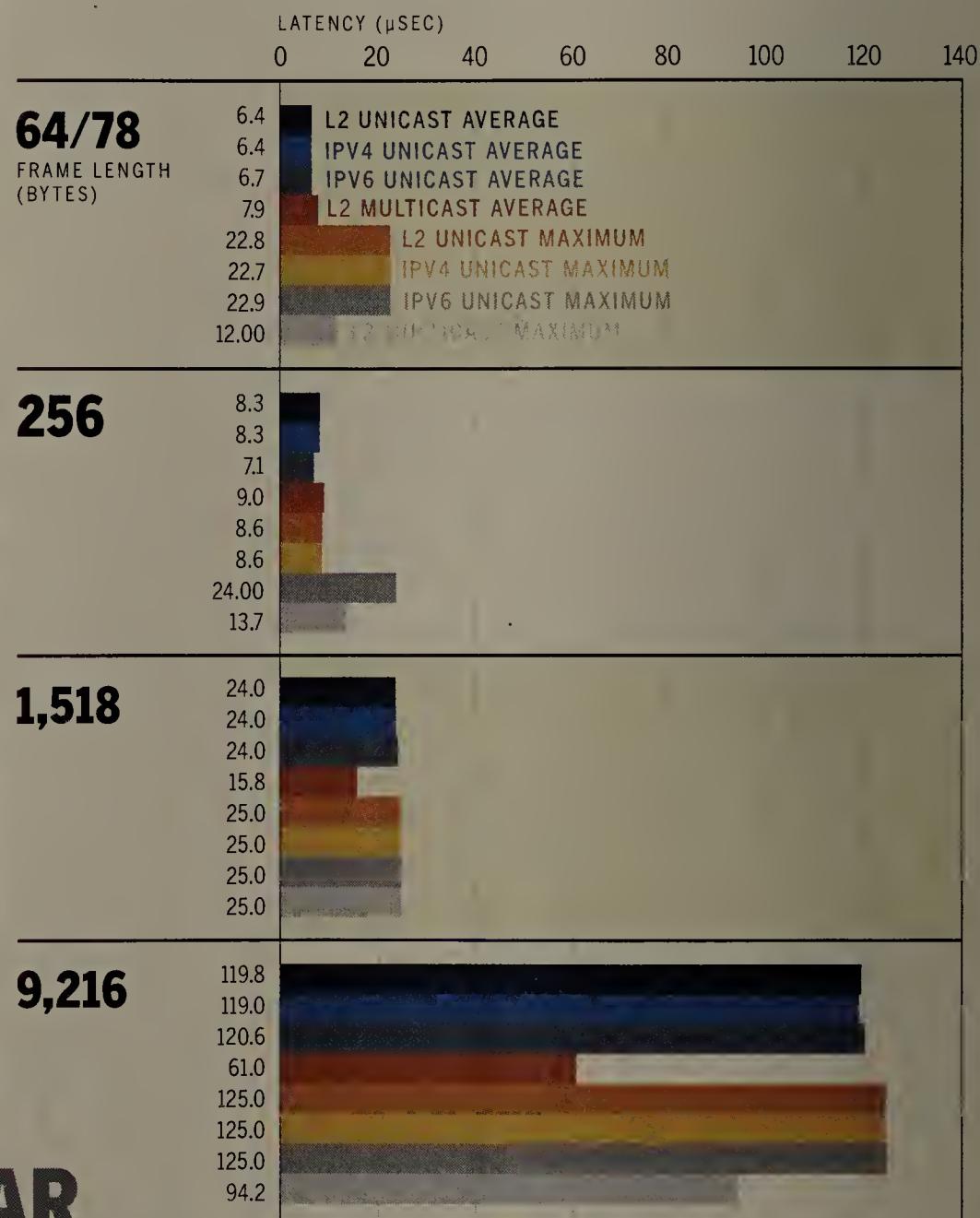
A common PoE misperception is that adding

wattage means adding heat in the wiring closet. PoE is a method of power distribution, with the switch acting merely as a pass-through system. Most heat dissipation occurs at the powered device, not at the power-supplying equipment (in this case, the switch).

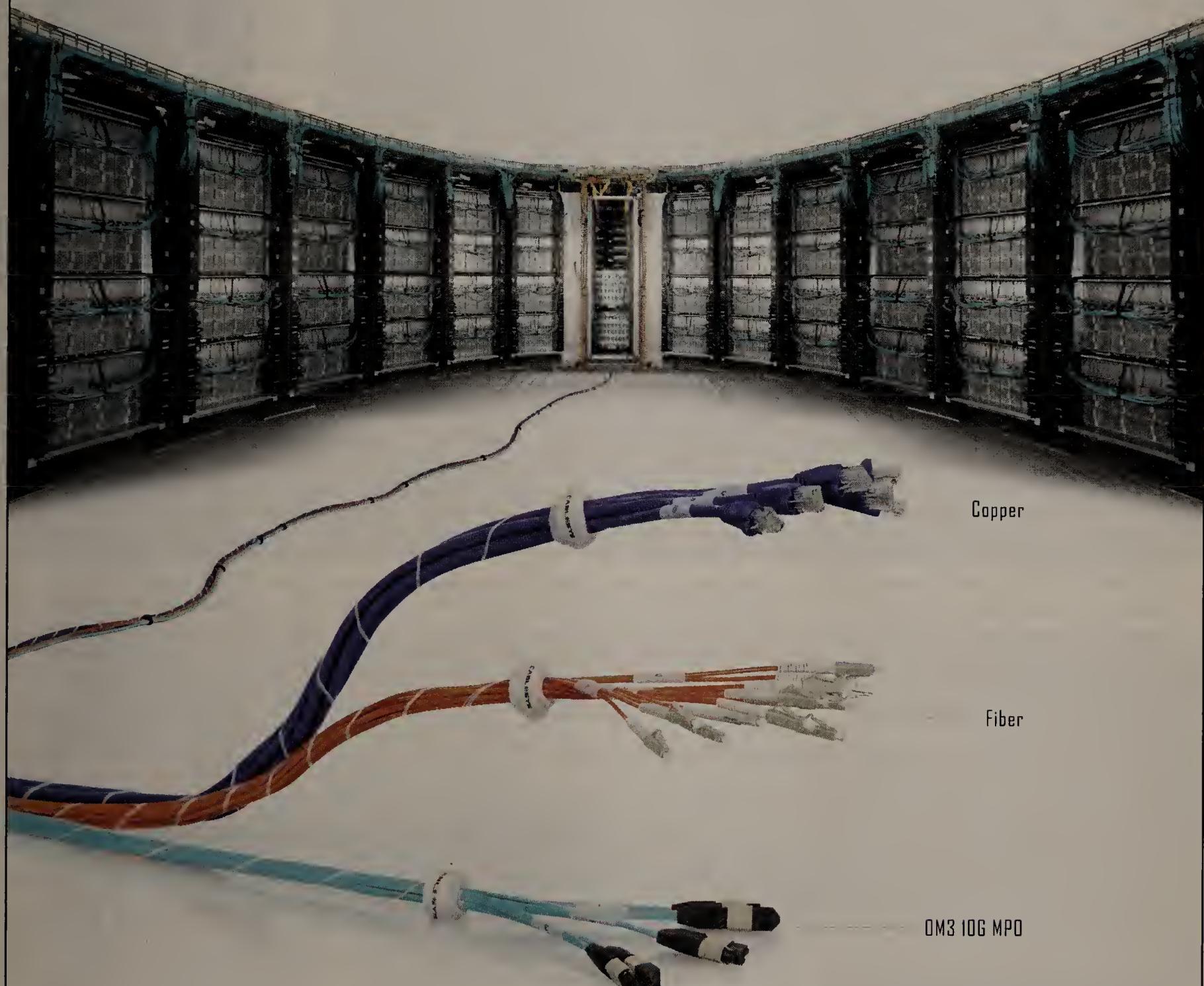
In contrast, another IEEE spec called energy-efficient Ethernet (EEE) specifically aims to reduce power at the switch port during idle periods. In a test of new EEE-capable line cards involving 384 copper Gigabit Ethernet ports, we saw power consumption

Catalyst 4500 delivers low latency

We blasted various frame sizes and types of traffic through all 384 Gigabit Ethernet ports on the Catalyst 4500 and found that the switch consistently delivered low latency.



NOTE: 64-byte frames used for L2 and IPv4; 78-byte frames used for IPv6

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fall from 1,462 watts to 1,278 watts when we enabled EEE, a 12.6% power savings.

Cisco also demonstrated an alpha version of a protocol analyzer running on the Supervisor 7-E module. Network engineers familiar with Wireshark and tcpdump will be right at home with the analyzer, which can save captures to a file or present them in format similar to a Wireshark decode in a terminal window. This early version captured only 100 packets, but Cisco says a version slated for release this fall will be limited only by buffer memory on the supervisor card. Like Wireshark, the analyzer uses capture and display filters to zero in on interesting packets.

The analyzer can be used in conjunction with Flexible NetFlow (FNF) and Embedded Event Manager (EEM) features of the supervisor card to take action in response to network conditions. For example, FNF can identify a SYN flood attack, and a simple EEM script could then shut down the affected switch port or throttle traffic rates. Similarly, the analyzer could start a capture of any unknown protocol.

FNF can track more than 70,000 concurrent flows on the Supervisor 7-E module. We verified this by enabling FNF during all performance tests, and saw FNF tracking 73,536 of the 147,072 flows we generated.

Performance is job one

Delivering high throughput and low latency is job one for any Ethernet switch, and accordingly we devoted most testing in this area. We measured throughput and latency with four test cases: Layer 2 unicast, Layer 3 unicast, with separate IPv4 and IPv6 tests; and Layer 2 multicast. We also measured media access control address capacity and the time needed to upgrade and downgrade software.

Unlike many modular switches, the Catalyst

NETRESULTS

Product	Catalyst 4500
Company	Cisco
Price	Supervisor 7-E module, \$19,995; UPOE line card, \$9,500; EEE line card, \$7,000; 10-slot system as tested, \$133,975.
Pros	60-watt PoE per port; low latency; solid management tools.
Cons	Switch fabric is blocking with short frames.



4500 uses a centralized switch fabric, which means all flows have the same latency regardless of source and destination port. Many newer switches use distributed architectures that exhibit low latency between ports on a single switch module but higher latency when crossing the switch backplane. By measuring the latency of every frame in every flow using the Spirent TestCenter traffic generator/analyizer, we verified uniform latency across all flows.

Average and maximum latency was remarkably consistent across test cases. With short frames offered in a fully meshed pattern among all 384 ports, the switch held up traffic for an average of around 6.5 microseconds for unicast traffic. With multicast traffic, tested with 383 ports all subscribed to the same 1,000 multicast groups, average latency was 7.9 microseconds.

There was little variation in delay across different unicast test cases, indicating that the switch processes all flows the same way in hardware. Perhaps more significantly, latency is relatively low for a large Gigabit Ethernet modular switch.

While the Catalyst 4500 doesn't delay traffic for long, its fabric is blocking under some conditions. The new Supervisor 7-E card, like the 6-E before it, has a processing limit of 250 million frames per second, and that in turn limits non-blocking performance to 167 out of a possible 384 Gigabit Ethernet ports.

With all 384 ports fully loaded, system throughput is only around 43.7% of Gigabit Ethernet line rate when handing 64-byte frames. With multicast traffic, the limit is lower still, around 38.5% of line rate with 64-byte frames.

Granted, no production network would ever see only short frames on all 384 ports of any switch. But 64-byte frames are very common (think TCP acknowledgments), and every dropped frame degrades application performance. Given that wire-speed "merchant silicon" ASICs have been around for 10

years or so, it's always surprising to see any new switch with blocking performance.

We also measured throughput for 256-, 1,518- and 9,216-byte jumbo frames. In those cases, the Catalyst 4500 forwards traffic at line rate on all 384 Gigabit Ethernet ports both for unicast and multicast traffic.

The Supervisor 7-E card also supports up to 96 10G Ethernet ports, increased from 30 ports in the 6-E, but we did not test these.

Another key acronym supported by the Catalyst 4500 is ISSU, or in-service software upgrade. This refers to the ability to upgrade and downgrade software with almost no disruption to users' control- or data-plane traffic. We tested this both to upgrade and downgrade software images while concurrently blasting all ports with line-rate traffic. In both cases, the cutover time was around 30.5 msec, well below Cisco's 50 msec claim.

The final test determined MAC address capacity, the maximum number of addresses the switch is capable of learning.

Virtualization can easily drive address counts into the tens of thousands. In our tests, the Catalyst 4500 learned 55,000 MAC addresses. That's probably more than enough for most enterprise data centers using virtualization.

As usual with Cisco switches, the Catalyst 4500 also supports a long list of other switching, routing, security and management features. For network managers who've long considered switching a commodity technology, the new power-management capabilities represent very interesting additions to the features list. Suddenly, the venerable Catalyst 4500 is no longer "just" an Ethernet switch, but a new way to distribute and manage power as well. ■

Newman is a member of the Network World Lab Alliance and president of Network Test, an independent test lab and engineering services consultancy. He can be reached at dnewman@networktest.com.

Thanks

Network World gratefully acknowledges the vendors that supplied key test bed infrastructure to make testing possible. Spirent Communications supplied its Spirent TestCenter traffic generator/ analyzer with both 10G and Gigabit Ethernet test ports. Sifos Technologies, vendor of power over Ethernet and Ethernet PHY test sets, supplied its Power Sync analyzers. Both companies also provided considerable engineering support during testing.

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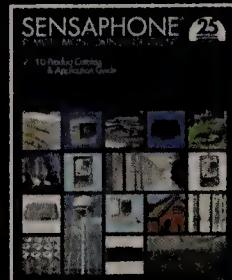
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BACKSPIN | BY MARK GIBBS

The horror of blue LEDs!

MODERN ELECTRONIC products are amazing. If you cast your mind back to when you were young (some of us need more casting than others), the fact that any of these things exist at all is just short of miraculous.

But along with this cornucopia of technical delights come some serious irritations. For example: blue LEDs.

I hate blue LEDs. It's not the color — I have no aesthetic problem with the color blue — it's the brightness. I have pieces of equipment with blue LEDs so bright, if I turn out the lights I can still read a book.

In my bedroom there's a blazing blue LED on my DVD player that sears your eyeballs if you look straight at it and another in an aftermarket power adapter (or, as I prefer to call them, "wall warts") for an iPod that bathes the entire bedroom in an eerie glow. And walk into my office — there are blue LEDs in most gadgets and/or their wall warts. It seems that everything now has a damned blue LED!

In the kitchen, there's even a blue LED in the coffee maker! Enough, product designers! Enough! It's gotten so bad I've started putting pieces of tape over the LEDs. Couldn't we have a change of pace? Maybe a nice dull, friendly green LED or a cheery, muted cherry red one? Is that too much to ask?

While I'm on the topic, wall warts! They breed like metal coat hangers! And they're all different with the majority being great, lumpy things that take up as much socket real estate as possible.

And why can't manufacturers label the damn things! Come on guys, it's easy. Just a little sticker on the side of the adapter would make everyone's life so much easier.

I have this huge box full of wall warts which have accumulated over the last four or five years. Given there are no working devices without wall warts and there are so many in the box — at least 100, which has to be more than the all of the discarded gear — the only reasonable conclusion is that they do, in fact, breed.

And you know what happens: Should you fail to label your wall warts and then be so careless as to allow a piece of gear and its adapter to become separated for more than about 10 seconds, you'll find yourself in an episode of "Mission Impossible." Something like your phone will be dying and you'll be looking for the one adapter with that weird, almost but not quite mini-USB-style connector that is, like every other connector you can lay your hands on, matte black.

Of course, if you can find the right adapter, you can never figure out which way the connector should be inserted. I have a cellphone where, unless you get the insertion angle just right, the connector won't go in. So I always wind up turning the connector over and trying again but now it certainly won't go in because that's the wrong way up! So I turn it over one more time and wriggle the connector into the socket and it turns into an exercise of grind to fit. Pah! What ever happened to design?!

So, I'd like to ask for your nominations for equipment with really annoying details whether it be blinding LEDs, dorky wall warts, lack of labels or poorly designed connectors. Perhaps we'll award a prize ... I'm thinking my box of unlabeled adapters would be perfect. ■

Gibbs is geared up in Ventura, Calif. Your nominations to backspin@gibbs.com.



NETBUZZ | BY PAUL MCNAMARA

Monkey business with a camera

NEVER MIND the infinite monkey theorem reproducing Shakespeare, what we were asked to ponder last week is a lone black macaque commandeering a photographer's unattended camera to shoot a few amusing pictures ... and touch off a copyright debate in the process.

Copyright issues certainly have become more complex in the digital age. In this instance, professional photographer David Slater was at the center of the monkey business — along with the monkey, of course — while on a nature shoot in Indonesia.

At the center of the copyright debate was the technology blog Techdirt, which claimed that its publication of the photos was covered by fair use even if Slater or his photo agency — or the monkey — can claim copyright, which Techdirt maintained that they cannot.

The photo agency sent Techdirt a letter asking that the images be removed from its website. Techdirt told the agency to go pound sand.

Great fun.

While possessing no legal training, I am paid to have opinions, so here are a few of mine:

Putting copyright law aside, these photographs clearly belong to Slater in the generally accepted sense of belonging. The camera is his. He brought it to Indonesia. He placed it — however unintentionally — so as to be accessed by the monkey. And he retrieved the photos from his camera once he regained possession.

Absent any single aspect of Slater's participation, the photos are not with us today; in other words, if a monkey takes a picture in the forest and there's no one there to see it, they might as well not exist.

Techdirt is probably on firm ground when asserting that its use of the photos in a blog post examining the copyright issues constitutes fair use.

However, those online outlets that used the pictures because they are cute — and there were many — have much less of a case if the pictures are copyrighted.

And, if the photos are indeed not covered by copyright they should be and those rights should belong to Slater. He's a professional and the pictures are a result of his work. The fact that a monkey helped should not be determinative, in part because I cannot imagine that lawmakers ever contemplated that particular what-if scenario.

But I'm fine if it turns out that copyright belongs to the monkey.

Upcoming Jobs bio renamed

The authorized biography of Steve Jobs that isn't due to be published until next year already has a new name.

Fortune reports: "The old one, 'iSteve: The Book of Jobs,' was chosen by Simon & Schuster's publicity department. The author, Walter Isaacson, was never quite sure about it. His wife and daughter, however, were. They thought it was too cutesy."

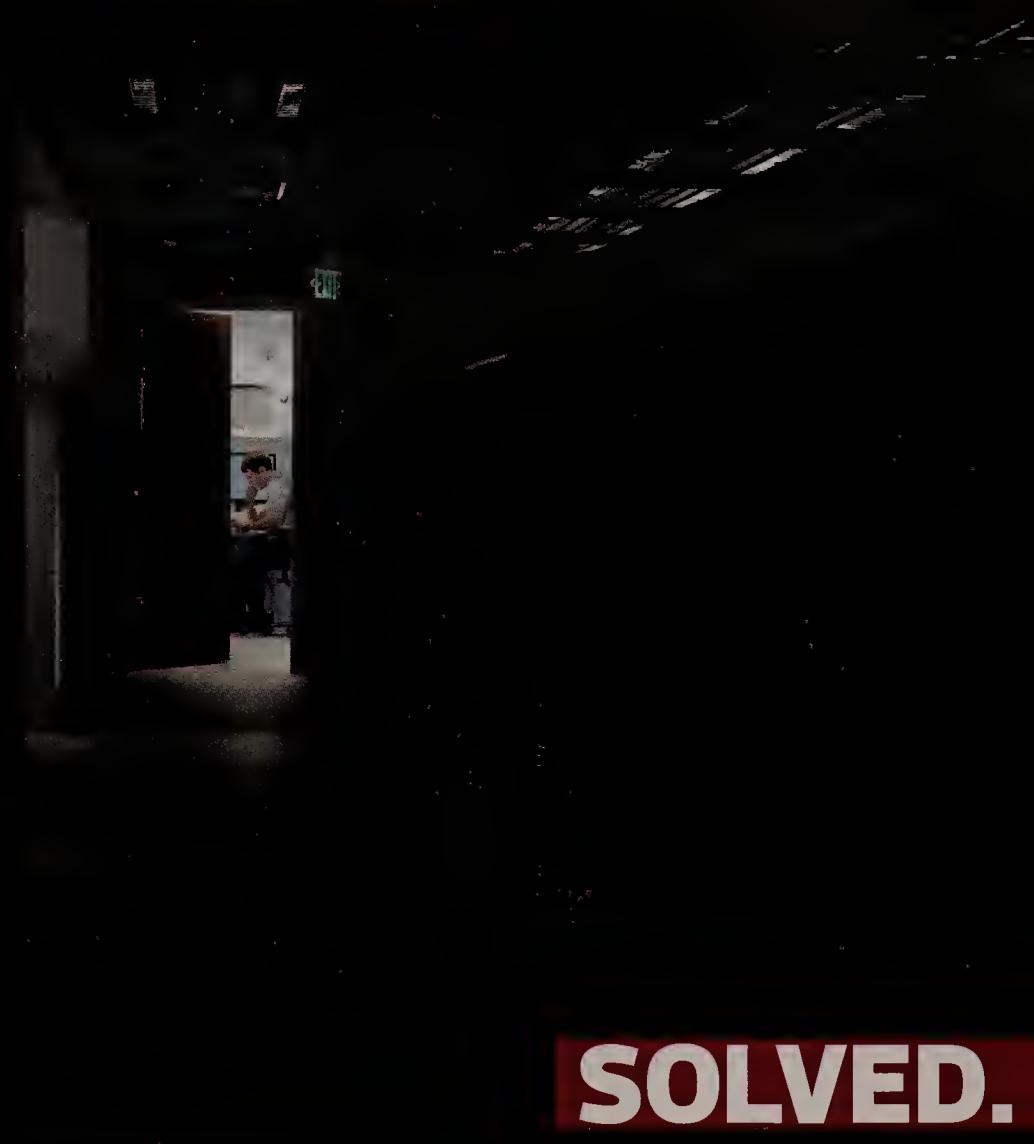
Cutesy is one word for it. Pretentious is another.

Whatever your view of the original, it will now be replaced by this much simpler title: "Steve Jobs," by Walter Isaacson.

I haven't seen the cover art, but would presume that the first name is in larger type than the second. ■

Have a better idea? The address is buzz@nww.com.

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